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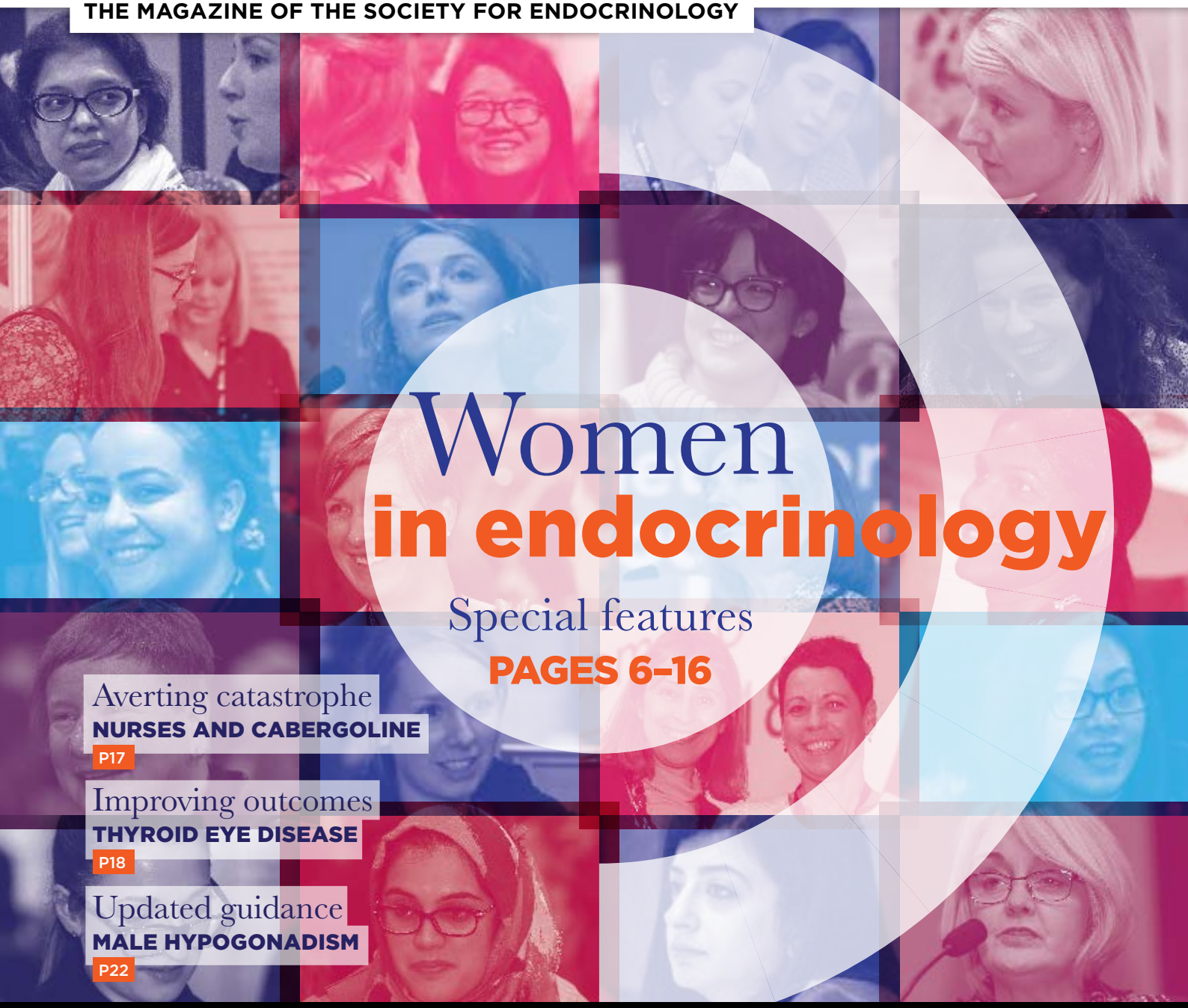
THE ENDOCRINOLOGIST

THE MAGAZINE OF THE SOCIETY FOR ENDOCRINOLOGY



Women in endocrinology

Special features
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A word from THE EDITOR...

In this issue of *The Endocrinologist*, the achievements of women in endocrinology past and present are showcased. We hope that our celebration of these successes will contribute to a shift towards equality that is needed across STEMM disciplines (science, technology, engineering, mathematics and medicine).

Helen Simpson opens the issue with an account of the current gender equality landscape in endocrinology. Rachel Jennings and Kate Lines describe some of the challenges and rewards of an academic career for women, as a clinical lecturer and an early career scientist respectively.

Vicky Salem, Lizzie Avis and Kevin Murphy have explored gender biases, closer to home, at our national annual conference (SfE BES). Saira Hameed provides a historical view of women in endocrinology, referring to intellectually formidable women who advanced endocrinology in game-changing ways.

Maralyn Druce summarises the key features of the Athena SWAN programme. The conversation between early career clinician scientist Kerri Devine and senior academic Philippa Saunders covers the challenges of networking, peer support and balancing family. Deborah Garlick highlights the need to introduce good practice for menopause into the workplace.

It is impossible to do justice in this Editor's note to all the women in endocrinology, so I shall rapidly cede the floor to those excellent women who are contributing to this edition!

With warmest good wishes

AMIR SAM

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Become a contributor... Contact the Editorial office at **endocrinologist@endocrinology.org**

The Society welcomes news items, contributions, article suggestions and letters to the Editor. We would also like to hear your feedback on this issue of the magazine.
Deadline for news items for the Summer 2019 issue: **18 March 2019**.

CHANGES AT *THE ENDOCRINOLOGIST*

Thank you, Lisa Nicholas, for all your great work on this magazine! Lisa's term on the Editorial Board finished at the end of 2018.

Any Society member who is interested in contributing to *The Endocrinologist*, either as an author or as a member of the Editorial Board, is invited to email **media@endocrinology.org** for more details.

Lisa Nicholas

APPLY FOR EARLY CAREER PRIZE LECTURES

Apply now for the chance to present your work to the wider endocrine community at the Society for Endocrinology BES conference 2019 in Brighton. Successful applicants also receive a £750 honorarium and publish an article on their work in *The Endocrinologist*. You must submit your abstract by 30 April. See **www.endocrinology.org/grants-and-awards/prizes-and-awards/early-career-prize-lectures**.

SfE BES VIDEO HIGHLIGHTS

Don't miss our selection of plenaries, 'how do I' sessions and masterclasses from SfE BES 2018, available to watch online now at **www.endocrinology.org/events/sfe-bes-conference/sfe-bes-2018/videos-from-sfe-bes-2018**.

SUPPORT TO ENGAGE NON-EXPERTS

Public Engagement Grants of up to £1000 are available to support Society members' outreach activities.

You need to apply by 27 March. Find out more at: **www.endocrinology.org/grants-and-awards/grants/public-engagement-grant**.

INSPIRE THE NEXT GENERATION

With a Society Summer Studentship, you could fund an undergraduate student to gain experience in your lab this summer. The application deadline is 13 March.

Find out more at **www.endocrinology.org/grants-and-awards/grants/summer-studentships**.

HERE'S HELP TO BOOST YOUR CAREER

Don't miss these approaching deadlines for Society grants, which are available to help fund your research, travel or lab equipment:

- A **Travel Grant** can help you meet and engage with the endocrine community worldwide: apply by **13 March**.
- With a **Regional Clinical Cases Meeting Grant**, you could organise a local meeting to share recent and interesting endocrine cases: apply by **3 April**.
- A **Practical Skills Grant** would help you forge new collaborations or learn skills by funding a visit to another lab or attendance at a workshop: apply by **10 April**.
- The Society's **Early Career Grants** provide financial support to boost your research: apply by **15 May**.
- An **Equipment Grant** could buy vital equipment for your laboratory: apply by **15 May**.
- **Endocrine Nurse Grants** help fund projects that enhance nursing clinical practice: apply by **15 May**.

Visit **www.endocrinology.org/grants-and-awards** for full details of how to apply, and for more Society funding opportunities.

SOCIETY CALENDAR

12 March 2019
NATIONAL CLINICAL CASES 2019
London, UK

8–9 April 2019
ENDOCRINE ACADEMY: ENDOCRINE NURSE UPDATE 2019
Birmingham, UK

8–10 April 2019
ENDOCRINE ACADEMY: CLINICAL UPDATE 2019
Birmingham, UK

27 June 2019
NATIONAL TRAINING SCHEME FOR THE USE OF RADIOIODINE IN BENIGN THYROID DISEASE
Birmingham, UK

11–13 November 2019
SfE BES 2019
Brighton, UK

www.endocrinology.org/events for full details

SOCIETY SUPPORTED EVENTS

14–17 April 2019
BNA 2019 FESTIVAL OF NEUROSCIENCE
Dublin, Ireland

25–30 August 2019
SPETSES SUMMER SCHOOL – NUCLEAR RECEPTORS, EPIGENOMICS, AND DISEASE
Spetses, Greece

GRANT AND PRIZE DEADLINES

13 March 2019
SUMMER STUDENTSHIPS

13 March 2019
TRAVEL GRANTS

27 March 2019
PUBLIC ENGAGEMENT GRANTS

3 April 2019
REGIONAL CLINICAL CASES MEETING GRANTS

10 April 2019
PRACTICAL SKILLS GRANTS

30 April 2019
EARLY CAREER PRIZE LECTURES

15 May 2019
EARLY CAREER GRANTS

15 May 2019
EQUIPMENT GRANTS

15 May 2019
ENDOCRINE NURSE GRANTS

29 May 2019
THEMED SCIENTIFIC MEETING GRANT

www.endocrinology.org/grants-and-awards for full details of all Society grants and prizes

HOT TOPICS

SOCIETY FOR ENDOCRINOLOGY OFFICIAL JOURNALS

Society members have free access to the current content of *Journal of Endocrinology, Journal of Molecular Endocrinology, Endocrine-Related Cancer* and *Clinical Endocrinology* via the members' area on the Society home page, **www.endocrinology.org**. *Endocrine Connections* and *Endocrinology, Diabetes & Metabolism Case Reports*, the Society-endorsed case reports publication, are open access (OA) and free to all.

JOURNAL OF ENDOCRINOLOGY

Organoids as a model for pituitary stem cell exploration

This study describes the development of pituitary organoids as a tool for understanding pituitary stem cells. Organoids are three-dimensional structures cultured *in vitro*, which may more closely resemble the organ from which they are derived (e.g. in terms of function and phenotype) than traditional cell culture.

Cox *et al.* collected anterior pituitary tissue from euthanised mice, and suspended cells in droplets made from culture medium and Matrigel® matrix. These were allowed to grow into spherical structures, dubbed 'pituispheres', and were supplemented with appropriate nutrients and growth factors. Differentiation into different endocrine cell types was limited. Some immunopositivity was seen for growth hormone, prolactin and the α glycoprotein subunit of thyrotrophin, luteinising hormone and follicle-stimulating hormone in organoids transplanted sub-renally into living mice. The investigators also found that organoids cultured from damaged pituitary tissue were more likely to be cystic.

Whilst the model currently has limitations, there is undoubtedly much potential for pituitary organoids to be a valuable tool in pituitary stem cell research.

Read the full article in *Journal of Endocrinology* **240** 287–308

JOURNAL OF MOLECULAR ENDOCRINOLOGY

Mechanisms for sex differences in energy regulation

Males and females differ in the circulating levels of sex hormones, as well as the sex chromosome content of their cells. These factors are major contributors to sexual dimorphism in energy balance, and all sex hormones – oestrogens, progesterone and androgens – play sex-dependent roles in the regulation of body weight, as Wang *et al.* examine in this review.

Androgens have a prominent role in the regulation of body weight and energy balance in both sexes. In women, higher serum androgen concentrations correlate with a higher body mass index, while in men serum testosterone levels are inversely correlated with obesity. In female mice, chronic treatment with dihydrotestosterone increases adiposity. Male mice with global androgen receptor knockout show an age-dependent phenotype, with increased body weight and adiposity in aged males. Androgen signalling in the liver also contributes to energy homeostasis, as male mice lacking liver androgen receptors develop obesity when fed with a high fat diet, while female mice do not.

Factors other than sex hormones or their receptors are also likely to contribute to the sex-dependent differences in regulation of body weight. The authors suggest these factors should form a focus for future studies.

Read the full article in *Journal of Molecular Endocrinology* **62** R129–R143

ENDOCRINE-RELATED CANCER

Distinct mechanisms of oestrogen signalling in endometrial cancer

The action of oestrogen via its receptors is important in the pathophysiology of both endometrial and breast cancer. Oestrogen receptor-α (ERα) is expressed in up to 80% of breast and endometrial cancers, but anti-oestrogen therapy is effective in breast but not endometrial cancer. To assess potential differences, Baxter *et al.* used data from the The Cancer Genome Atlas (TCGA), in conjunction with cell line studies, to investigate the molecular mechanisms of oestrogen signalling in endometrial and breast cancers.

Phosphorylation of ERα at serine residue 118 (ERα-pSer118) was found to be prognostic for endometrial but not breast cancer in TCGA data. High ERα-pSer118 levels were associated with significantly worse progression-free survival and poorer overall survival in endometrial cancer. Gene expression profile analysis demonstrated that ERα-associated networks were distinct between tumour types. ERα co-regulators, including FOXA1 and GATA3, were differentially expressed between endometrial and breast cancer cell lines, but recruitment to target genes was similar in all cell lines. However, XBP1 (X-box-binding protein-1) recruitment and co-recruitment with ERα at target genes was increased with oestradiol treatment in endometrial and not breast cancer cells. XBP1 was also found to be an independent prognostic factor, and high XBP1 expression was associated with significantly improved progression-free survival in endometrial tumours.

Read the full article in *Endocrine-Related Cancer* **26** 31–46

ENDOCRINE HIGHLIGHTS

A summary of papers from around the endocrine community that have got you talking.


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Obesity intervention needed before pregnancy

In wealthy countries, ~50% of women are overweight or obese when they become pregnant, putting mother and baby at risk of a range of adverse outcomes.

The multicentre, randomised, double-blind, placebo-controlled GRoW (Metformin for Gestational Restriction of Weight in Pregnant Women) trial studied the potential use of metformin to reduce pregnancy weight gain and improve outcomes. Dodd *et al.* studied more than 500 overweight or obese women (body mass index ≥25 kg/m^2) at 10–20 weeks' gestation from three public maternity units in Adelaide, SA, Australia. Metformin (≤2000mg per day) had no significant effect on the proportion of infants with birthweight >4000g compared with placebo, but did reduce weekly pregnancy weight gain. Total gestational weight gain, pregnancy and birth outcomes, and maternal diet, physical activity, quality of life and emotional well-being, did not differ significantly between groups.

For overweight or obese pregnant women, metformin given in addition to dietary and lifestyle advice from 10 to 20 weeks' gestation does not appear to improve outcomes. The authors suggest a focus on dietary and lifestyle interventions before pregnancy 'to break the cycle of intergenerational obesity'.

Read the full article in *Lancet Diabetes & Endocrinology* **7** P15–P24

Hot Topics is written by Douglas Gibson, Louise Hunter and Helen Simpson.

HT

CLINICAL ENDOCRINOLOGY

Hyponatraemia in community-acquired pneumonia

Hyponatraemia is the most common inpatient referral to endocrinology services, and is frequently seen in cases of community-acquired pneumonia (CAP).

This prospective clinical study by Cuesta *et al.* aimed to determine whether hyponatraemia was linked to syndrome of inappropriate antidiuresis (SIAD) in CAP, and if it was best managed by fluid restriction. Of 1723 patients with CAP, 143 (8.3%) had hyponatraemia (sodium <130mmol/l); 66 (46%) had SIAD, 60 (42%) had hypovolaemic hyponatraemia, 13 (9%) had hypervolaemia hyponatraemia, and 4 (3%) had hyponatraemia due to glucocorticoid deficiency (GD). Sodium, plasma arginine vasopressin and antidiuresis fell with antibiotic usage in the SIAD group, without fluid restriction. Persistent hyponatraemia suggested underlying lung disease, such as bronchiectasis. It is noteworthy that 3% of patients had GD, reflecting the prevalence of inhaled steroid use, which needs managing with glucocorticoid replacement.

The authors suggest that fluid restriction therefore may not be the most appropriate management technique in CAP and SIAD, and that isotonic fluid may be appropriate, noting management should be based on careful patient assessment.

Read the full article in *Clinical Endocrinology* doi:10.1111/cen.13937

ENDOCRINOLOGY, DIABETES & METABOLISM CASE REPORTS

Partial androgen insensitivity syndrome presenting as pubertal gynaecomastia

Pubertal gynaecomastia is common, occurring in up to 65% of healthy teenage boys. So how should we pick up those with significant pathology?

Here Vaidyanathan & Kaplowitz describe an otherwise healthy male aged 17 years 7 months, with sparse body hair, Tanner stage 3 breast development, Tanner 3 pubic hair and testes 15ml bilaterally. Blood levels were luteinising hormone (LH) 14.4µU/l, follicle-stimulating hormone 7.7µU/L, testosterone 1660ng/dl, oestradiol 64pg/ml, and karyotype was 46,XY.

Because of the under-virilisation, persistent gynaecomastia, high testosterone, elevated LH and oestradiol, a diagnosis of partial androgen insensitivity syndrome (PAIS) was considered. A novel A721T missense mutation was detected in the androgen receptor gene. The variant has been denoted as c.2161G>A at the c.dna level. The patient underwent bilateral mastectomy and decided against testosterone therapy.

Clearly this is a rare diagnosis, with PAIS having a prevalence of 1 in 20,000. This is another rare but important cause to consider when seeing patients with gynaecomastia.

Read the full article in *Endocrinology, Diabetes & Metabolism Case Reports* doi:10.1530/EDM-18-0128

ENDOCRINE CONNECTIONS

Glucocorticoid management of adrenal insufficiency in the UK

The choice of glucocorticoid replacement in adrenal insufficiency (AI) is not uniform. Patient and healthcare professional preference, prescribing guidance and availability may influence the type and formulation of glucocorticoid used.

In this study funded by Shire International GmbH, Iqbal *et al.* used primary care data to capture a UK-wide picture of glucocorticoid replacement in AI. They included individuals with a read code for AI and a record of hydrocortisone or prednisolone prescription between 2010 and 2016 from the THIN (The Health Improvement Network) database. Of this cohort of 2648, 44.3% had a diagnosis of primary AI and 43.4% secondary AI (for the remainder, the diagnosis could not be determined from the read code). 72.2% were treated with immediate-release hydrocortisone, 1.7% with modified-release hydrocortisone and 26.1% with prednisolone. Numbers with either primary or secondary AI were very similar in each treatment group. Data on emergency glucocorticoid provision were not captured.

Data on prevalence of vascular risk factors (high across all groups) and on healthcare attendance are also of interest. Patients on immediate-release hydrocortisone had a mean of 6.5 GP attendances per year, with 9.5 per year in prednisolone-treated patients.

Read the full article in *Endocrine Connections* **8** 20–31

Dangers in treatment of child and adolescent gender dysphoria

The Endocrine Society published a clinical practice guideline on 'Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons' in 2017, an updated version of its guidance from 2009. A group of concerned endocrinologists have expressed their dissent to this guideline in a Letter to the Editor of the Endocrine Society's *Journal of Clinical Endocrinology & Metabolism*.

Laidlaw *et al.* warn of the serious dangers of puberty-blocking medications and cross-sex hormones in treatment of child and adolescent gender dysphoria, '…which can lead to increased risk of death from cardiovascular disease, life-threatening blood clots, permanent sterility and sexual dysfunction, among other problems'. The group add that there are as yet no objective tests to diagnose a 'true transgender' child or adolescent, and they are concerned that children may be misdiagnosed.

The authors wish to open a dialogue about the real medical and scientific consequences of hormonal therapy. Given the widespread societal interest in this dialogue, this is surely a hot topic for the future.

Read the full article in *Journal of Clinical Endocrinology & Metabolism* **104** 686–687

Blocking hormone uptake burns more fat

Development of beige fat cells in white adipose tissue (WAT) might protect against obesity and improve systemic metabolism. It is a particularly appealing target for the treatment of metabolic diseases through norepinephrine (NE)-mediated signalling pathways.

Song *et al.* found that the catecholamine transporter, mouse organic cation transporter 3 (Oct3), is highly expressed in WAT, where it mediates NE uptake in the white fat cells *in vivo* and *in vitro*. Removing Oct3 in the fat cells leads to enhanced lipid breakdown, increased thermogenesis and browning of WAT when stimulated by NE or cold exposure via activation of the β-adrenergic receptor/ protein kinase A/cyclic adenosine monophosphate-responsive element-binding protein pathway. In humans, reduced functional alleles of *OCT3* are also associated with increased basal metabolic rate.

The results suggest that Oct3 is an essential regulator of NE recycling and the beiging of WAT. Development of specific inhibitors could offer possible treatments for metabolic diseases, with new drugs to help burn stored fat and reduce weight.

Read the full article in *PLOS Biology* doi:10.1371/journal.pbio.2006571

GENDER EQUALITY IN ENDOCRINOLOGY: WHERE ARE WE NOW?

WRITTEN BY HELEN L SIMPSON

Being a dutiful parent of a budding sociologist, I have been broadening my mind. My reading has included *Women and Power: a Manifesto* by Mary Beard.[1] She quotes an exchange between Telemachus and Penelope from Homer's *The Odyssey*, where he says 'Mother, go back up into your quarters and take up your own work, the loom and distaff … speech will be the business of men, all men, and of me most of all; for mine is the power in this household.' Beard then describes how women have been battling this context ever since.

Darwin doesn't seem to be much more enlightened. In *The Descent of Man*, he writes 'The chief distinction in the intellectual powers of the two sexes is shewn by man attaining to a higher eminence, in whatever he takes up, than can woman – whether requiring deep thought, reason, or imagination, or merely the use of the senses and the hands.'[2]

THE PICTURE IN THE NHS

So, where are we now? Unlike Homer's Penelope, I leave my quarters on a daily basis. Indeed, women make up 77% of the NHS workforce. In the specialty of diabetes and endocrinology in 2017, 53% of higher specialist trainees were female, and 34% of consultants.[3] In contrast, in NHS England, 85% of national clinical directors are male – a severe case of 'He-Ja-Vu' maybe? (A term describing the situation where a white male leader is replaced by another white male leader followed by another white male leader, and so on.[4])

THE SITUATION IN ACADEMIA

Academia looks even less balanced. Data from higher education institutions in 2018 show 54% of staff in higher education are female. For science, engineering and technology, 20.7% of professors are female, and across higher education 31% of senior managers are female.[5] At the University of Cambridge, 17% of professors are female, 9% of Fellows of the Royal Society are female and 3% of Nobel Laureates are female (12 for physiology or medicine and 3 for physics).

Life in the lab doesn't lend itself to career breaks for raising a family. Listen to a wonderful conversation between Professor Dame Jocelyn Bell Burnell and Professor Dame Athene Donald on this subject, that is both inspiring and depressing in equal measure.[6]

The Wellcome Trust and MRC are very transparent about their data (available from **www.wellcome.ac.uk** and **www.mrc.ukri.org**). Among Wellcome Trust-funded senior lectures, 44% are female, whilst 16% of funded professors are female. The MRC shows data concerning grant recipients (Table). Females have a good chance of success when they apply, but they are not applying at senior levels.

It seems the higher you go, the more women are discriminated against, or absent.

IN A LEARNED SOCIETY

Closer to home, the Society for Endocrinology membership is 1416 male, 1139 female. Whilst the data must be viewed with caution as the following categories are broad, and the information is infrequently updated, there are some interesting headline figures.

Junior endocrinologists are predominantly female: fellows (postdoc or research) are 56% female and 61% of student members are female. Clinical practitioners are 37% female, basic researchers 39% female, and clinical researchers 37% female, whilst 19% of retired endocrinologist are female.

This gives the impression of a changing workforce, which is not a new finding, and it will be interesting to see how the landscape looks in 10–20 years' time.

CONFERENCE DELEGATES

The highlight of the endocrine year is our Society for Endocrinology BES conference. In 2018, invited speakers (medal winners (plenary speakers) and those chosen by Programme Committee) were 44% female. Of those invited, 26 declined the invitation, but interestingly those declining comprised 15 males and 9 females. Invite us and we will come!

Overall, the whole programme was 47.5% female. Several categories stood out:

- plenary speakers were 7 male:3 female
- basic science/translational symposia 17 male:4 female
- oral communications (clinical) 9 male:15 female.

Whilst we can't draw too many conclusions, there were occasional 'manels' (a panel of speakers populated entirely by men[4]), and the predominance of junior female basic scientists in the membership is not yet being represented in the programme, whereas the same doesn't seem to be true for clinicians.

The plenary lectures showed a male gender preponderance. The 2017 programme also had 7 male:3 female plenary speakers, while in 2016 the ratio was 9 male:1 female plenary speakers (of the 7 plenary lectures organised by the Society Nominations Committee in 2017, three were delivered by women).

These data are in line with what others have described; there is an implicit bias that works against women being invited as a keynote or guest speaker at meetings. They are consequently less likely to share research findings, they have lower visibility and are less likely thereafter to be nominated for awards.

Is it time to ensure our prominent roles show more gender balance, or are these data reflecting the lack of change in gender equality currently at the top of academia?

Table. Adapted from MRC 2017/18 Grant Application Success Rate data[14]

Grant type	Gender	Percentage of applicants	Percentage of applications awarded	Success rate
New Investigator Research Grants	Female	43%	50%	24%
	Male	56%	50%	18%
Partnership Grant	Female	27%	50%	67%
	Male	73%	50%	25%
Programme Grant	Female	18%	26%	56%
	Male	82%	74%	34%
Research Grants	Female	35%	33%	23%
	Male	64%	66%	24%

THE GENDER PAY GAP

Another area of concern has been the gender pay gap. The mean pay gap across the NHS in 2017 was 21.2%. However, for Clinical Excellence Awards (the means by which more senior clinicians get a bonus), the mean gender pay gap was 51.4% – so, for those awarded bonuses, the mean salary of male consultants was 51.4% higher than that of female consultants.

Some institutions have a minimal gender pay gap. That of Lancashire Teaching Hospitals is 0.1%, whereas Health Education England (HEE) has the highest at 52.5% (both median).[7]

The gender pay gap across an organisation may partly reflect that there are more women in administrative roles (for example), which are not so well paid as senior roles. It is likely the HEE data reflect this.

Care needs to be taken when interpreting gender pay gap data. The data do not necessarily differentiate whether an individual is paid less for the same role, for the same number of years of service. Also, whilst mean data show the difference between male and female pay, they can be skewed if there are small numbers of very large payments.

WHY DOES THE PAY GAP EXIST?

Some have tried to look at reasons for the gender pay gap. Roy describes American data from clinicians which suggest a gender pay gap of $100,000 in salary between men and women:[8]

- $40,000 was considered attributable to practice characteristics
- $13,000 was linked to choice of specialty
- $12,000 was associated with hours worked
- about 30% of the disparity remained unexplained.

This notes that there are cultural influences and biases deterring women from entering some specialties. Women generally spend more time on unpaid caring responsibilities, creating a double burden of work. There are societal expectations, and medical and academic cultures, affecting career choices and progression.[9] And there are career consequences of hitting the 'maternal wall'.[10] There is certainly a loss of earnings associated with part time or flexible working, and not just in medicine.

'Care needs to be taken when interpreting gender pay gap data. The data do not necessarily differentiate whether an individual is paid less for the same role, for the same number of years of service.'

Claudia Goldin, Professor of Economics at Harvard University, Cambridge, MA, USA, has extensively researched the gender pay gap and writes that it doesn't mean that females get paid less for the same roles as males. Some of the gap is due to flexibility in working patterns.[11] She suggests part of the answer is to make careers adaptable and flexible, having teams that can deliver work where possible, to reduce dependence on a single person. Interestingly, in the USA, pharmacy has the lowest gender pay gap of all professions. What can we learn from pharmacy?

ENSURING FUTURE PROGRESS

Clearly there is much still to do to achieve gender equality, and I haven't touched on power issues within a male-dominated workforce, including harassment or outright sexist behaviour. However, we should acknowledge that we have come a long way. We have some wonderful successful female role models across academia and clinical medicine in endocrinology. In 2017, there were eight female Presidents of Royal Colleges (elected), the Chief Medical Officers of NHS England and Scotland are both female,[12] and Professor Dame Jane Dacre is leading a review into the gender pay gap workforce, which will hopefully shed more light on why there is such a discrepancy and how it can be lessened.

'There is an implicit bias that works against women being invited as a keynote or guest speaker at meetings. They are consequently less likely to share research findings, they have lower visibility and are less likely thereafter to be nominated for awards.'

And whilst we have concerns about gender balance in medicine and academia, we need to remember that, in education as a whole, working class white males are the smallest demographic going on to study A levels.[13] Feminism is the belief in the social, economic and political equality of the sexes, and we should aim for gender equality across all of society.

HELEN L SIMPSON
Consultant Endocrinologist, Department of Diabetes and Endocrinology, UCLH NHS Foundation Trust, London

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THE VIEW FROM HERE: A WOMAN IN ACADEMIC MEDICINE

WRITTEN BY RACHEL JENNINGS

When I was a medical student, I did not for one second imagine I would pursue a career in academic medicine – I hated research! However, following an intercalated BSc, I caught the bug.

I spent the first few years as a junior doctor focusing on gaining clinical competencies and obtaining MRCP, before embarking on a PhD as an MRC Clinical Research Training Fellow. I'm currently an academic clinical lecturer (ACL), spending 50% of my time in specialty training, and 50% protected for research.

A BALANCING ACT

I love my job, and I believe the ability to combine research and clinical training is far more rewarding and satisfying than a purely clinical post. It can, however, be quite challenging. It is difficult to juggle the demands of two institutions – the NHS and the university – whilst trying to fulfil the requirements needed to gain a certificate of completion of training. The addition of protected research prolongs specialty training; combined with two periods of maternity leave, I am a perpetual trainee!

Those who work less than full time (LTFT) find their years of specialty training heading into double figures. I am in a fortunate position to be able to work full time, as my husband and I have the financial means to afford a great nursery, and also benefit from supportive grandparents. Not everyone is so lucky – periods of maternity leave, coupled with LTFT working and childcare responsibilities, contribute to a gender pay gap among UK doctors of, on average, £10,000.[1] Given that women make up more than half of the workforce in medical specialties (including endocrinology), this is pretty shocking.

WEIGHING UP THE PROS AND CONS

Although balancing a career in academic medicine with the pressures of parenthood can be tricky, there are many benefits. I am fortunate to be working in a specialty I am passionate about, and to be able to concentrate on my research interests. Having no fixed clinical commitments (during research blocks) offers flexibility with childcare and frees up precious weekends. There are also options to work from home when writing grant applications or manuscripts (although the chances of getting any work done with small children around are slim!).

There are some downsides. You never truly switch off from research, and very frequently have to work during your 'free' evenings and weekends. Opportunities to spend time in other labs (particularly abroad) – often viewed as essential to success in academia – are also diminished, due to the logistics of arranging childcare, taking children out of school, etc.

THE FEMALE 'DROP OFF'

I'm working towards applying for clinician scientist awards. Whilst women make up a little over half of clinical predoctoral fellowship awardees, there is a decline in the proportion of female fellowship holders at later career stages. This is particularly the case at the stage of establishing research independence and in more senior roles (37% of intermediate fellowships and just 12% of senior fellowships were awarded to females).[2] Data from the National Institute for Health Research (NIHR) reveal approximately 50% of predoctoral academic clinical fellows are female, dropping to 34% for ACLs.[3]

So why is there such a drop off? For clinicians, the academic route is often a risky one, with fixed term contracts and the constant need to secure funding. The lure of a substantive NHS consultant post, with its job security, is often too strong. A recent report highlighting barriers to academic career progression found female participants were more likely to cite family commitments as a barrier to advancement.[4]

TRAVERSING THE HURDLES

There are other hurdles faced by (predominantly) women when pursuing a clinical academic career. For example, doctors training in academic medicine often cannot transfer benefits that are dependent upon a minimum duration of service within either NHS or university employers – the most obvious benefit being parental leave. Consequently, many people suffer a financial penalty for working between the two institutions.

> *'My research pretty much came to a standstill during maternity leave … Whilst most funding body review panels take into account career breaks or flexible working, can I be as competitive as someone who hasn't had any career gaps?'*

Thankfully, my employer changed its maternity entitlement policy just before my maternity leave. It is, however, one of only a few universities in the country to recognise previous NHS employment. Conversely, some NHS Trusts don't recognise previous university employment. As the majority of parental leave is taken by women, this constitutes a form of gender discrimination.

Another issue frequently faced by female academics is that research often grinds to a halt during maternity leave. There may not be anyone to carry out experiments in your absence and, whilst extensions may be granted by funding bodies, funds are often in abeyance for the duration of leave, including essential costs such as animal maintenance and publication fees (researchers still publish during maternity leave!). Certain research (such as clinical trials) cannot be halted, leaving some researchers no alternative but to work during leave.

My research pretty much came to a standstill during maternity leave. And, as researchers know, a lot can happen in a few months! Whilst most funding body review panels take into account career breaks or flexible working, can I be as competitive as someone who hasn't had any career gaps?

LOOKING TO THE FUTURE

The future is beginning to look positive for women in academic medicine. Efforts are in place to advance gender equality within academia, such as implementation of the Athena SWAN Charter in Higher Education Institutions. The Academy of Medical Sciences' SUSTAIN programme provides training and support to female researchers in developing career potential.

Within endocrinology, we have a great number of inspirational female clinical academic role models. We should be as confident and assertive as our male counterparts in pursuing a career in academic medicine, as the benefits far outweigh the challenges!

RACHEL JENNINGS
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THE VIEW FROM HERE: A FEMALE EARLY CAREER SCIENTIST

WRITTEN BY KATE LINES

My scientific career began in 2007 at The Barts Cancer Institute, London, when I started my PhD. I was in the Department of Molecular Oncology, and was studying mechanisms of development of pancreatic cancer. Our group leader was a female clinician, my day-to-day supervisor was a female postdoc and the other PhD student in the lab also a woman. We had one male team member, a research technician.

After my PhD, I moved to the Oxford Centre for Diabetes, Endocrinology and Metabolism (OCDEM) at the University of Oxford, as a postdoctoral scientist for Raj Thakker. This was where I joined the endocrinology family. I now research mechanisms and treatments for pancreatic neuroendocrine tumours, and have been doing so for 7 years. Our team currently consists of 12 people, 9 of whom are women.

Therefore, despite working in slightly different disciplines, from early in my career I have been part of predominantly female research groups. Maybe because of the number of women I have worked with, until now gender has never really been an issue. I've never felt I've been treated differently from any of my colleagues (male or female) either at work, or at meetings and conferences. Maybe I've been lucky, as I do have friends from my PhD days who've had different experiences.

ENCOUNTERS OUTSIDE SCIENCE

Interestingly, the people who have made comments about what I do are non-scientists/non-clinicians. I always love the reaction when I meet someone for the first time and they ask what I do for a living. When I say I'm a scientist at the University of Oxford, the usual reaction is a look of surprise, generally followed by 'I never would've guessed that!' or 'Oh, so you're a science teacher, what age children do you teach?' The other classic exchange is 'Is it Miss or Mrs?', and when I say 'It's Dr.' I get the response 'Oh!'

ACHIEVING RESEARCH INDEPENDENCE

I'm now reaching an interesting stage of my career, the point of trying to achieve research independence. I'm sure this is a daunting prospect for all researchers, and it isn't any different for me. This is when I must take 'a leap' to try and get funding for my own research and, more challengingly, for my salary.

To date, I've managed to get a few research grants for consumables, but have always been employed, so haven't had to worry about getting money to pay my salary too. Luckily I have a contract for at least another 2 years as a postdoc, so I have a bit of time to come up with a plan.

Like most people, I'm considering two options: one is trying to get a lectureship position and the second is applying for a fellowship. Unfortunately, both are very competitive, with success rates for fellowships particularly poor. Of course, the more difficult route is the one I'd prefer. If I start applying soon, hopefully I will have something in place for when my contract ends. At least, this is what everyone seems to be advising me to do.

> ***'It is easy to see, however, that the number of female researchers seems to decline as you go up the academic pay scale … I like to think that this situation is now changing…'***

VALUABLE SUPPORT

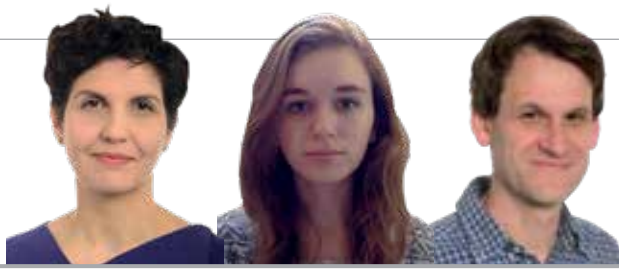
Actually, I've discovered that a lot of researchers are very helpful and more than willing to chat and give advice. This has definitely helped me to weigh up my options and to try and decide which would be the best for me. As much as it is terrifying, it is also an exciting part of my career. If successful I will be able to run my own group, doing my own research, which is what I've always wanted to do.

Based on my experience so far, I'm not expecting my gender to affect the process. It is easy to see, however, that the number of female researchers seems to decline as you go up the academic pay scale. There are definitely more male professors than female ones in the institutes I have visited.

I'm sure there are many reasons for this trend. I like to think that this situation is now changing, especially given that there are now so many inspirational female scientists as role models and mentors. All being well, I'm hoping I can become one too in the future.

KATE LINES
Postdoctoral Research Scientist, OCDEM, University of Oxford

GENDER BIAS AT THE SfE BES CONFERENCE?



WRITTEN BY VICKY SALEM, LIZZIE AVIS AND KEVIN MURPHY

The culture and environment at academic conferences highlight many of the reasons posited for the gradual attrition of women from science: the 'leaky pipeline'. Conferences are important for academics and clinicians to share research, network and increase visibility. Recent research has demonstrated that scientists who attend conferences are more likely to co-author papers.[1] Personal, face-to-face communication still matters, still sparks ideas and fosters collaboration. This has clear implications for people, often women, who feel unable to travel because of caring commitments.

The types of presenters that audiences see will shape the conclusions they draw about who can succeed in a field. Diverse role modelling and mentorship are vital and proven elements to improving representation.[2] Selection bias often results in women being disproportionately under-selected for plenaries or as expert opinion leaders, a phenomenon that is magnified when there are fewer women on selection committees.[3] Women are also shown in studies to underestimate their future performance or worthiness compared with the self-appraisal of equally qualified men.[4] They may not promote themselves as confidently, which probably results in lower visibility at conferences.

THE SfE BES CONFERENCE

All of these issues may also explain an observation that we had made over the years: women seemed to be less likely to participate in questions or discussions at our national annual conference (SfE BES).

There are many reasons for asking a question at a conference session, from curiosity through to proclaiming one's own standing in a particular field. It seemed to us that women may indeed be less likely to participate in this.

Interestingly, when we mooted this possibility, informally, with our colleagues who attend the conference, many suggested that such a gender gap was not pertinent in endocrinology. After all, the clinical arm has achieved gender parity at consultant grade well before most other medical specialties. The conference itself seems well attended by young researchers and very well gender-balanced.

So, we decided to examine all the questions that were asked at SfE BES 2017 in Harrogate. We directly observed or accessed recordings of all the sessions at the conference, and studied the audience participation.

OUR OBSERVATIONS

We found there were clear differences in the ways in which women and men engaged with speakers. Women asked fewer and shorter questions regardless of the age or the proportion of women in the room. Overall, the sessions were gender-balanced in terms of audience numbers of men and women. Yet, across more than 200 instances of audience questions or comments, only 21% came from women.

Questions were more likely from older men and women, reflecting an increasing confidence with age and seniority. However, even in the career development sessions, which were heavily attended by younger women (over 60% of the audience), none of the questioners were female.

It is, of course, well established that men are more represented in senior positions, even in endocrinology (fewer than 20% of endocrinology professors are women), which goes much of the way to explaining why we saw such a skew in the gender of the questioners. However, it is important to highlight that gender imbalances persisted across age and seniority boundaries.

The leaky pipeline or persistent gender gap in publication success is not correcting anywhere near as quickly as should be expected,[5] making it unwise to assume that conference participation findings will completely dissipate as the current older generation of male opinion leaders retire.

What else did we observe? Interestingly, qualitative analysis revealed that women were far more likely to raise questions about sexual dimorphism in research findings, a topic upon which research councils are now very focused. They were also less inclined to self-promote, rarely talking about their own accomplishments.

IN CONCLUSION

Our observations suggest that, even in specialties such as endocrinology which have good female representation clinically, gender biases at professional conferences persist and, indeed, may contribute to female attrition up the academic ladder.

This deeply entrenched problem requires redress from many angles, such as reforms in education, mentoring and academic publishing. As a microcosm of the broader academic culture, professional conferences are a particularly important platform for tackling academic diversity. Meaningful actions could include engaging gender balance amongst chairs, encouraging younger delegates to take the first question, encouraging delegates to think of questions in an unpressured way (possibly in advance), ensuring equal numbers of female plenary speakers, orchestrating childcare cover at conferences, and encouraging senior delegates to talk to younger ones.

An interesting finding from the 2017 conference was that the presence of at least one female moderator (Chair) and/or having the opening question come from a woman seemed to increase the likelihood of future questions coming from women in that session. In fact, female participation was doubled by having gender-balanced or female-only moderators compared with male-only moderators at sessions.

We repeated the study at SfE BES 2018 in Glasgow, with the aim of investigating whether changing the make-up of our Chairs and questioners made a difference, and hope to share the results with you in the near future.

It can seem as if overcoming the many different types of bias or disadvantage that lead to the under-representation of women in endocrinology and, indeed, in medicine and the life sciences, is an uphill struggle. However, there do seem to be simple changes we can make personally and institutionally that would make a real difference.

Perhaps, as some of our informal discussions on this topic have suggested, simply raising delegates' consciousness of the issue is the most important step to take. On that note, thank you for reading!

VICKY SALEM, LIZZIE AVIS AND KEVIN MURPHY
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WOMEN IN ENDOCRINOLOGY: A HISTORICAL VIEW

WRITTEN BY SAIRA HAMEED

'I'm writing an article about "Women in endocrinology",' I tell some colleagues, 'from a historical perspective.' They think it over for a moment. I can see them trying to come up with a suggestion, a name. Finally, one capitulates and asks, 'Who will you talk about?'

Bring together the words 'history' and 'endocrinology', and the work of (the all-male) Drs Graves, Addison, Conn and Cushing, amongst others (also men), comes to mind. These men, working in the early to mid-twentieth century, retain their historical prominence because we spend our professional lives looking after and researching their diseases, name-checking them most days of the week.

But the history of our speciality has not just been about men naming diseases. These eponymous conditions have only been understood and characterised because of work carried out by three women of enormous historical significance. All of whom, by co-incidence, are called Rosalind or Rosalyn.

ROSALIND FRANKLIN

It is hard to think of an area of endocrinology that has not been touched by the genomics revolution. Today, the HLA associations of autoimmune thyroid disease, or the genetic signature of certain endocrine cancers, or the molecular endocrinology that continues to advance our frontiers is so embedded in our subject that even the undergraduate curriculum acknowledges that endocrinology cannot be understood in the absence of genetics.

Robin Stott, via Flickr (CC BY-SA 2.0)

It's in this arena that we meet our first Rosalind: Rosalind Franklin, whose work at King's College London on X-ray images of DNA was central to the description of the structure of DNA in 1953.

Her famous 'photograph 51', capturing the double helix, was shown to James Watson and Francis Crick. The consensus view is that Franklin never appreciated just how much of her data Watson and Crick had referenced to make their model.

In 1958, at the age of 37, Rosalind Franklin died of ovarian cancer. Ten years later, Watson and Crick were awarded the Nobel Prize in Physiology or Medicine for elucidating the structure of DNA. History is written by the victors, which might explain why it took many years for a third name, that of Rosalind Franklin, to be finally and rightly associated with the words 'double helix'.

ROSALIND PITT-RIVERS

Our second Rosalind, Rosalind Pitt-Rivers, was a contemporary of Franklin's. Both were working in London in the early 1950s: Rosalind Franklin characterising the structure of DNA, Rosalind Pitt-Rivers investigating iodinated compounds.

This phase of Pitt-Rivers' research life culminated in 1952 with the discovery of tri-iodothyronine (T3), for which she was almost immediately

MRC-NIMR (CC BY 3.0)

elected as a Fellow of the Royal Society. She was just the eleventh female FRS, the first having been admitted only 9 years before. Earlier female nominees had been rebuffed for a number of reasons, including one who was turned down on the basis that, as a married woman, she had no standing in law.

The significance of Pitt-Rivers' identification of T3 and her subsequent work on deiodinase activity in extra-thyroidal tissues had wide-reaching effects within endocrinology. First, the idea of a pro-hormone that is converted to the biologically active hormone applies beyond thyroid hormones and is found throughout endocrine physiology. Secondly, the discovery that individual tissues can regulate their own hormone exposure through local enzymatic activation and inactivation has created a new paradigm for endocrine control, checks and balances.

ROSALYN YALOW

Our final Rosalyn is, of course, Rosalyn Yalow, whose work developing the radioimmunoassay (RIA) meant that we could measure hormone levels in bodily fluids.

It was not hyperbole when the Karolinska Institutet said, on the award of her Nobel Prize in Physiology or Medicine in 1977, that the RIA which Yalow had pioneered 'brought a revolution in biological and medical research'. It is certainly impossible to think of endocrine practice and research without the ability to measure hormones.

In her speech at the Nobel banquet, Rosalyn Yalow addressed the under-representation of women in the sciences as well as within leadership positions, warning us that, 'The world cannot afford the loss of the talents of half its people, if we are to solve the many problems which beset us.'

US Information Agency (Public Domain)

Yalow made this address over 40 years ago, yet her words still have resonance today. Endocrinology is not immune to the issue of gender discrimination that afflicts the rest of society. However, taking the long view of our discipline brings into focus the strides that certain extraordinary women have made on behalf of all of us, men and women alike.

To paraphrase Hillary Clinton, although we still haven't shattered the glass ceiling, thanks to the work of these intellectually formidable women, who advanced endocrinology in game-changing ways, it's got three very large cracks in it.

SAIRA HAMEED
Consultant Endocrinologist, Imperial College Healthcare NHS Trust, London

WHAT YOU DON'T KNOW CAN'T HURT YOU ... CAN IT?

WRITTEN BY MARALYN DRUCE

It is just over 100 years since the suffragettes campaigned for gender parity for voting in the UK, and we really have come a long way since that time. Now we know that over half of our medical students are women, and more and more women are studying science-based subjects and developing careers in science. So all is well, right? Or is it?

Large datasets, such as those collected by the OECD (Organisation for Economic Development), help us to understand how things are in our own country with respect to gender equality, and to compare ourselves with other member countries. The expression 'think globally, act locally' has become embedded as the way to get things done. How can we 'act locally' without knowing what action needs to be taken? For higher education establishments, the Equality Challenge Unit (ECU) provides a mechanism.

THE ATHENA SWAN CHARTER

The Athena Project was a national science, technology, engineering, maths and medicine (STEMM) diversity project, which ran from 1999 to 2007. Its aim was to 'advance and promote the careers of women in science, engineering and technology in higher education and research, and to achieve a significant increase in the number of women recruited to top posts in the UK'. The project was set up by and for women in the academic science community, and has been further developed in the Athena SWAN Charter.

This charter initially aimed to increase the representation of women in STEMM, but its scope was expanded in 2015 to include non-STEMM subjects and to consider the issues of gender balance and gender representation more broadly among academic and also professional and technical staff. It has been overseen by the ECU but was latterly taken over by Higher Education England.

ADOPTING THE CHARTER

Institutions – which can be individual departments, schools or whole universities – make a formal commitment to follow the ten principles of the charter and apply for an Athena SWAN Award, at bronze, silver or gold level. Each award is valid for 4 years under the post-2015 rules.

The principles focus on promoting and supporting gender equality. In particular, the charter aims to address what is known as the 'leaky pipeline' of women progressing to senior roles in science by:

- removing obstacles to their advancement
- ensuring equal pay and
- mainstreaming support.

This is achieved through action at all levels across the department or organisation.

APPLYING FOR AWARDS

The process of applying for an award is one of extensive data collection and intensive data analysis, applying the findings to devise institution-specific interventions to improve imbalance. To achieve a silver award, such interventions and initiatives must have demonstrable impact. Institutions at gold level should be beacons of achievement in gender equality, should champion and promote good practice and should have measurable impact in the wider community, nationally or internationally.

INCENTIVISATION

Minds have been focused by money. The NIHR BRC/BRU (National Institute for Health Research Biomedical Research Centres and Units) funding guidance states that a minimum silver Athena Swan Award is required. In addition, the NIHR have announced that academic clinical fellows and clinical lecturers may now only be funded if attached to units holding an Athena SWAN silver award. The linkage to money is not a bad thing, as guidelines where there is no penalty for failing to achieve rarely succeed. For this reason, most universities and departments now have their own self-assessment teams, preparing or planning applications.

MEASURING SUCCESS

There is some evidence that charters such as Athena SWAN can have measurable and positive impacts on the areas of imbalance that they seek to redress.[1] However, the programme itself recapitulates the gender imbalance, as the proportion of women engaged in this unremunerated and academically unrewarded work exceeds roles taken by men,[2] and institutional attitudes to the programme and its implementation remain cynical.

It is difficult to link specific impacts to particular interventions, as the wider context is so relevant. For example, it is difficult to say honestly that a mentoring scheme is directly responsible for an increase in women receiving academic promotion. Appropriate goals, targets and benchmarks are a perennial problem – is a 50/50 split of men and women at all levels the only reasonable ideal in all circumstances?

Finally, even institutions that adhere closely to action plans may report dispiriting results. The national data on the proportion of women in professorial roles remain disappointingly flat over several years. However, with the gender pay gap topical, it is worth noting that modelling implementation gender equality programmes can be shown to have an important impact.[3]

IN CONCLUSION

While we might debate the nuances of the programme, such as whether the focus is too broad, or the workload inequitably distributed, a key feature of the Athena SWAN Awards is the close evaluation of organisation-specific data and the ability to benchmark your own institution against other comparable departments, via published data or by other institutions' own, freely available, Athena SWAN self-assessment documents.

Understanding one's own context is the first building block in seeing where change is needed and creating the possibility for change to occur. Presenting institutional data to the senior leadership is also an important exercise in winning hearts and minds over to supporting an action plan for change.

It is undoubtedly a cumbersome, often painful, time- and life-consuming experience to chair an Athena SWAN self-assessment team. However, at least a process exists, and it is one which is clear, transparent and shared across the higher education sector.

Gender inequality is as real and problematic in clinical medicine as it is in academia, yet the NHS has no comparable national framework to review information or create change. Perhaps it is time to consider such a thing?

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PERSPECTIVES OF SUCCESSFUL WOMEN

DISCUSSED BY KERRI DEVINE AND PHILIPPA SAUNDERS

Join us as we sit in on a fascinating conversation between early career clinician scientist Kerri Devine and senior academic Philippa Saunders, as they cover the challenges of networking, peer support, balancing family and budgeting time.

P: How has your career developed so far?

K: After undergraduate medicine with an intercalated BSc, 7 years of clinical training, including 2 years as a diabetes and endocrinology registrar, I've just become a student again and started my PhD.

P: How did you manage to get taken on to do a PhD, because that's quite a big step isn't it?

K: It is a big step and I think, perhaps especially for women, that timing is everything. I came to Newcastle for my specialty training and knew I wanted this to include some time in research. I initially approached Simon Pearce (my co-supervisor on my PhD) who introduced me to Brian Walker. He had recently come to Newcastle and was actively looking for someone to join him on an existing project. So I was looking and they were looking for me, and we matched!

P: Did your local NHS Postgraduate Dean have to give permission for you to take time out?

K: Yes, that is essential. I sit on the regional Specialty Training Committee and I'm also on the Early Career Steering Group for the Society for Endocrinology. Because of recent issues with trainee recruitment, trainees entering research is an area that could be compromised. I know the Deanery are really passionate about trainees still going into research, but it is a concern and such a key aspect of the specialty.

P: This highlights the importance, I believe, of leadership within our universities. By that, I mean it is important that senior academics both encourage and support clinical research trainees. One of my biggest tips for making the most of this training opportunity is to think ahead to your exit strategy. It is good to make sure that you draw not only on the support of your supervisors but also on that of a peer group. Some of the best support I've had in keeping going as a woman in science has come from peers.

K: I'm fortunate to work alongside female clinical academics who have now come out of training and who have been very supportive and very encouraging. Some of them are also mothers now, and they give advice on how to maintain balance and demonstrate that it is possible. I think that is so helpful and inspiring.

P: Yes, the team around you can be vital. So what have you done so far in your PhD?

K: My project is on tissue-specific differences in steroid metabolism, focusing on the ABC (ATP-binding cassette) transporter family. I'm following on from work by Catriona Kyle, who was a winning presenter at the Society for Endocrinology BES conference. At the moment, I'm going through the process of procurement and sponsorship for a clinical study. It's a big change for me. I've gone from having every moment of my day accounted for and planned by someone else, to having to plan everything for myself.

P: That's a very honest appraisal of the real differences between feeling each day is full and that you can make a difference to people, and moving to the self-directed aspect of PhD work. Keep in mind why you're doing it and what you want to get out of it, because that can be really helpful in keeping up momentum and remaining positive when things are going slowly. Are you going to do any work with patients or is it all very much a science project?

K: No, a large part of my work will be on healthy volunteers, but it's a pathway to providing new solutions for patients that could make a big difference. Congenital adrenal hyperplasia (CAH) is an intended target patient group, so I'm making links with the teams in Newcastle who are looking after patients with CAH, and hope to continue this relationship after the PhD.

P: Building all those links is great, and will be invaluable in making the transition to the next stage of your career. I think it's very important not to be shy about going to meetings and making sure you take every opportunity to present your work.

K: Something I've heard discussed recently is that women can appear less inclined to respond to calls to present their work – to call themselves experts on the topic – and to step forward. Is this something that you have found?

P: I think there is plenty of evidence that women can be reluctant to put themselves forward for senior or leadership roles. Personally, I would say it's not that we don't have confidence in our own expertise, but I know I have felt anxious that if I am not successful it will in some way reflect badly on me and I will be labelled as being 'pushy'.

K: I've found it so helpful if someone who has 'been there before' supports you to put yourself forward. It does give you that extra self-belief.

P: Absolutely!

K: Earlier, you mentioned maintaining momentum. I think this is something that naturally puts women at a disadvantage. The stage

'It's all about building structures and networks so that you've got a support system … That would be my top tip – draw down on every bit of support you can get.'

'I am pleased to say that things are improving rapidly, which is good, as it used to be unbelievably sexist… Sometimes being a bit tough can pay off!'

at which you might start to publish, and to develop some form of reputation in the field, is also the time when you are reaching the point of having a family. How do you juggle that?

P: There's no right or wrong time. Children don't come to order. You mustn't short-change yourself by cutting maternity leave short because you think you're going to miss out at work.

Maintaining momentum is very much about putting things in place that can back you up. So, before going on maternity leave, make sure you have people who are going to communicate with you, maybe get a small grant before you go off so you've got something to come back to. It's all about building structures and networks so that you've got a support system.

That would be my top tip – draw down on every bit of support you can get.

K: In your position, you must be called upon to do so much. Do you ever feel like you can say no?

P: You have to learn to say no. When you're trying to establish your career, you're tempted to say yes to everybody and everything, but this can make you tired and resentful. Also, if there are fewer senior women in the department, they tend to get asked to do more.

I am pleased to say that things are improving rapidly, which is good, as it used to be unbelievably sexist. I was once asked to be part of a funding application by the head of the department as they needed 'a non-clinical woman' on the group. It wasn't anything to do with my skills or talents, it was just to 'tick a box'! After we got the money I felt bolder; I told them they had to give me a personal Chair and they did so. Sometimes being a bit tough can pay off!

K: Do you think attitudes have changed to women in academia as you've moved through your career?

P: I think attitudes are improving.

K: You mentioned that at the Academy of Medical Sciences you do lots of things to try and encourage women into those prestigious senior positions?

P: We're really trying to encourage people to get nominated. We insist that every committee is gender-balanced, and that everyone has to be trained in unconscious bias.

It's difficult to hit our target of 35% of elected fellows being women, but it's much better with grants and other schemes. Certainly on the grant panel I run – which is called 'Springboard' – the split among successful grant recipients is 50:50 between men and women. The Academy has some particular schemes that support women: one called Inspire is aimed at medical students, and the other, for lecturers, is called Sustain.

In terms of the fellowship, the Academy started 20 years ago, and there was a founding fellows pool where people were invited to be fellows – only 7% of those were women! Our target is 35% women to be elected each year. We're currently at about 33%, so there is still some way to go.

P: So, do you feel well supported in terms of whatever you might want to do?

K: Yes absolutely. My supervisors are very supportive and experienced in working with clinicians, with women in research and with managing career breaks. And, as you say, we do always have an eye on what is going to come next. Going back into clinical medicine is going to be a big challenge. I won't have been practising for a few years. It's going to be a learning curve, both in terms of getting back into practice and in trying to keep some research going at the same time. And that's exactly the kind of time I'd be thinking about starting a family.

P: I've seen that with so many people and I think, if you're aware of that, you can mitigate against it. But it is a hard thing to go back. The PhD is just a really special time.

K: What is it about it that's so special?

P: It's that freedom. It's your project. What an incredible privilege to be able to spend 3 years working on something you're interested in, with the aim of improving medical care.

K: The ultimate privilege, isn't it? I only hope I can get everything done on time!

P: Be organised, get yourself out on time. It's much easier because then you can apply for other things, otherwise you do lose momentum. I think that's important. Good luck!

KERRI DEVINE
Clinical Research Fellow, Diabetes and Endocrinology Trainee (OOPR), Specialty Training Committee, Newcastle University/ Northern Deanery, and Society for Endocrinology Early Career Steering Group

PHILIPPA SAUNDERS
Registrar, Academy of Medical Sciences; Professor of Reproductive Steroids, University of Edinburgh Centre for Inflammation Research, Queen's Medical Research Institute, Edinburgh

MENOPAUSE IN THE WORKPLACE: INTRODUCING GOOD PRACTICE

WRITTEN BY DEBORAH GARLICK

As the subject of menopause becomes, thankfully, less taboo, forward-thinking employers are now putting the right support in the workplace. This is a win–win situation, leading to increased retention rates, reduced absence and sickness, improved morale and less likelihood of employers being taken to an employment tribunal. And colleagues are very grateful to their employers for taking menopause seriously.

Until recently, menopause has often been treated as off-limits as a topic of conversation, much less something talked about at work. There has been a significant lack of awareness and understanding generally around this natural phase in a woman's life. But fortunately, this is starting to change. More celebrities and women have come forward to share their experiences and there has been an increase in coverage in the media.

WHAT IS MENOPAUSE?

The definition of menopause is when a woman has had no periods for 12 months. The time leading up to menopause is known as perimenopause, and afterwards is postmenopause. During the menopause transition, the balance of hormones in a woman's body changes, and this can result in a wide range of symptoms, both physical and psychological. These affect all women differently: some sail through menopause, while others can really struggle.

THE STATISTICS

- The average age for a woman to reach menopause is 51. However, it can be earlier than this due to surgery, illness or a natural early menopause.
- Of these, three out of four experience symptoms; one in four has serious symptoms.
- One in three of the UK workforce is over 50.
- Around eight in ten menopausal women are in work.
- According to the Office of National Statistics, menopausal women are the fastest-growing workforce demographic.

WHAT THIS MEANS FOR EMPLOYERS

These statistics demonstrate just why employers need to be taking menopause seriously. Three years ago, it was very rare to find an organisation with a menopause policy. However, the latest research (as yet unpublished) conducted by the Government Research Team,[1] the organisation Henpicked[2] and the TUC shows that over 10% of respondents say their organisation has one. This large-scale survey had over 5400 respondents, so it is a good indicator of the current situation. While this is clearly good progress, there is still much work to do.

EFFECTS OF MENOPAUSE ON WOMAN IN THE WORKPLACE

Hot flushes are a stereotypical symptom. While they are experienced by many women, the top six symptoms that women find most 'bothersome' according to our survey respondents are:

- fatigue
- difficulty focusing or concentrating
- insomnia
- hot flushes
- anxiety and worry
- problems with memory recall.

Aspects of work which women cited as making menopause symptoms worse are high temperature, poor ventilation, humidity, no access to a quiet or restful space, and noise. Long hours, short and changing deadlines, high workloads and dealing with customers, patients and clients can also make symptoms worse.

WHAT CAN EMPLOYERS DO?

It makes sense for a responsible employer to be keen to support women. They're working through the menopause transition, potentially through to their late 60s, and are likely to be working for many years postmenopause. This makes transition support and long term health a priority. In addition, most support will be temporary while symptoms last and is often easy for an employer to accommodate.

It's worth noting that employee relations issues and tribunals over menopause discrimination are increasing. Menopause is covered under the Equality Act 2010, and employers can be taken to an employment tribunal over age, sex or even disability discrimination if they fail to effectively take into account the potential impact of menopausal symptoms.

Some examples of best practice for employers include:

Introducing a policy or guidance documents

These can clearly inform senior leaders, line managers and employees about how the company will support menopausal women. Without these policies, employees will still have recourse to existing policies, such as sickness or flexible working, but it's a good idea for employers to address menopause separately.

Providing training

It's important to raise awareness and provide training to help line managers and colleagues understand how to support a menopausal woman and feel confident to talk about the subject. The Faculty of Occupation Medicine's research says that the majority of women don't feel comfortable talking to their line manager. The new research shows this is changing too.

Understanding that menopause is unique

No two women experience exactly the same level or combination of symptoms, so it's important for employers to provide support on a case-by-case basis.

Considering reasonable workplace adjustments

These could be as simple as a desk fan or extra uniform, and access to water and toilet facilities, or could take in flexible working or temporary reallocation of duties.

Creating a transparent working environment

It can be hard for women to approach their line manager about menopause, so helping create an inclusive, supportive workforce and talking openly about the subject at work are big steps in the right direction.

WHAT'S NEXT?

We expect the focus on menopause in the workplace to accelerate this year. Our mission is to encourage all employers to support menopausal women in the workplace.

DEBORAH GARLICK
Founder of **henpicked.net**, which 'shares the wisdom of women'
Henpicked, Ruddington, Nottingham

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AVERTING CATASTROPHE
CABERGOLINE AND THE CLINICAL NURSE SPECIALIST

WRITTEN BY MARIANNA SHIAFKOU

The dopamine agonist cabergoline is used clinically to inhibit prolactin secretion by the pituitary gland. Unfortunately, its side effects can include impulse control disorders. Through considering three separate cases (all names have been changed), we can see that clinical nurse specialists are best placed to identify and report early signs of these disorders.

CASE 1: 'MARK'

Mark is in his 20s, is employed and has a long term girlfriend. He presented with gynaecomastia, galactorrhoea, and reduced libido. His prolactin measured 23,047mU/l and testosterone 3.7nmol/l. A pituitary MRI confirmed a macroprolactinoma.

Mark and his girlfriend were counselled regarding cabergoline and treatment began at 250mg weekly. At 5 weeks, his prolactin fell to 4309mU/l. Aside from initial dizziness, his tolerance to cabergoline was good and so treatment was optimised at 750mg weekly. The response was excellent, with prolactin at 774mU/l and testosterone at 9.9nmol/l.

I increased my surveillance of Mark during the increased dose period, with frequent email exchanges, and noticed that the tone of his emails suddenly changed. His language had become excitable, with many declarations and exclamations, and included photos of expensive health supplements (including cannabis oil) he bought without our recommendation.

Concerned, I called Mark. He was very exuberant on the phone. He admitted to spending a 'little more than usual here and there'. His girlfriend said his spending had spiralled since increasing cabergoline. He had accrued a large credit card debt and purchased £5000 worth of music equipment he did not need and would not use. Unusually for this cohort, he recognised a change in habits and agreed to stop treatment without question, pending review.

Off cabergoline, his prolactin rose to 5460mU/l so it was resumed at 250mg weekly with close monitoring. He has deleted all shopping apps on his phone, stopped his credit card and agreed that his girlfriend will monitor his spending to further minimise risk.

CASE 2: 'ALI'

Ali is in his 40s and is a full time carer for his wife. They have three children. Ali presented with reduced libido, erectile dysfunction and low mood. Prolactin was 65,639mU/l and testosterone 3.4nmol/l, with imaging confirming a macroprolactinoma.

Under in-patient observation due to apoplexy risk, he started cabergoline. Ali and his family were counselled regarding cabergoline's effects and potential side effects. Prolactin fell to 19,448mU/l following a single 500mg dose and he was discharged on 500mg twice weekly.

Following a trial period, the dose was reduced to 250mg twice weekly. After 6 weeks, prolactin fell to 512mU/l and testosterone rose to 9.0nmol/l, correlating with an improvement in mood and libido.

Ali would often call me for reassurance in between clinic visits. There was a sudden change in the frequency and nature of these calls. He had become completely disinhibited and lacking in boundaries; his language was inappropriate and often sexual in nature. He admitted to downloading pornographic material, and said he was 'constantly aroused', which he felt was a signal of 'normal male function'.

As he was exhibiting signs of hypersexuality, I told him to stop cabergoline and arranged an urgent review. In clinic, he showed no insight into his behaviour and was aggrieved at having stopped treatment as he felt so well. At a subsequent appointment he became distressed when, at his request, I recalled the phone conversations, which were completely out of character. Reassured that he was no longer under the behavioural effects of cabergoline, he started 250mg weekly. His prolactin level remains within range and he is well.

> *'Risk limitation in cases of cabergoline-related impulse control disorders is reliant on frequent patient contact and the involvement of those closest to the patients.'*

CASE 3: 'LI'

Li is in his 30s, employed and is married without children. He presented with hypopituitarism, secondary to apoplexy of a macroprolactinoma, as confirmed on MRI imaging and by biochemistry (prolactin 3754mU/l).

He began replacement therapy (levothyroxine and testosterone) and cabergoline 500mg twice weekly with full counselling. His prolactin quickly fell to 169mU/l.

We kept in touch via email. One message was dramatically different in tone, written in unnecessarily large, bold font. He reported feeling very well, 'confident and full of energy', and was letting me know of his plans for travel, and various interests he had taken up, all of which sounded cost-prohibitive.

We spoke on the phone and he did not share my concerns. He reluctantly agreed to come into clinic with his wife, who confirmed Li's spending pattern and described piles of online purchases that sat unopened, including many duplicate items. Li had booked first class long haul flights and planned several other costly trips. Li's wife said that his spending was beyond their means and she became very distressed in clinic when he accused her of being 'instrumental' in convincing us to stop treatment. The consultation was prolonged and difficult.

On reflection, Li can compare his mood and behaviour on and off treatment. He sleeps better, feels calmer and his thoughts are more rational. His wife vetoes any expenditure. He remains off cabergoline and under close surveillance, with a current prolactin level of 442mU/l.

IN CONCLUSION

Risk limitation in cases of cabergoline-related impulse control disorders is reliant on frequent patient contact and the involvement of those closest to the patients. Clinical nurse specialists have an important role to play in picking up subtle but significant changes in mood, language and behaviour.

MARIANNA SHIAFKOU
Clinical Nurse Specialist – Pituitary Tumours, Department of Endocrinology, Barts Health NHS Trust, London

IMPROVING OUTCOMES IN THYROID EYE DISEASE

WRITTEN BY PETER TAYLOR, ANNA MITCHELL, JANIS HICKEY, JOHN WASS AND COLIN DAYAN

Thyroid eye disease (TED) is a profoundly distressing, disfiguring and sometimes sight-threatening complication of Graves' disease. It affects over 50,000 people in the UK. Strong evidence indicates that the impact of the disease can be reduced by preventive measures, as well as early specialist intervention.[1]

The Amsterdam Declaration, an international declaration signed in 2009, called for increased use of preventive measures, with halving of the time from presentation to diagnosis and referral to a specialist centre. However, recent data collected by the UK TED Amsterdam Declaration Implementation Group (TEAMeD) and others indicate a >30-fold variation in the provision of specialist surgery for TED across the UK, and delays of 27 months or more before patients are seen by a specialist service.[2–4]

With a window of active disease of 12–24 months, the opportunity for early intervention is frequently lost. Furthermore, recently published data suggest that combination immunotherapy in the active phase of the disease can lead to improved outcomes.[5,6]

THE TEAMeD-5 PROGRAMME

At least 80% of cases of TED occur in patients who already have a diagnosis of Graves' disease and have been referred to specialist endocrine services. The TEAMeD-5 Programme (**www.btf-thyroid.org/projects/teamed/332-teamed-5**), launched at the Society for Endocrinology BES conference 2017 (see *The Endocrinologist* **125** 6–7), aims to raise awareness amongst endocrinologists and patients with Graves' disease of the importance of prevention, early detection and prompt referral to ophthalmological services with particular expertise in TED.

The elements of the TEAMeD-5 Programme are shown in Box 1. TEAMeD has developed, tested and made nationally available supporting material to implement this programme, including a referral pathway, TED early warning cards, bespoke smoking cessation advice and a screening tool, as well as clinic posters, advice on mild TED and other materials.[7–9] TEAMeD is working closely with the British OculoPlastic Surgery Society (BOPSS) to define an appropriate multidisciplinary specialist ophthalmology service for TED and to ensure that high quality provision is available across the UK.

Box 1. Elements of TEAMeD-5.

1. DIAGNOSE Graves' disease accurately (e.g. using TSH receptor antibody (TRAb) testing) to identify patients at risk of TED.
2. SCREEN all patients with Graves' disease for early symptoms and signs of TED.
3. ALERT patients with Graves' disease to the early symptoms of TED using a TED early warning card.
4. PREVENT TED in Graves' disease by smoking reduction, early induction and maintenance of euthyroidism and avoidance of radioiodine in active TED.
5. Promptly REFER patients who develop TED, directly to a regional multidisciplinary clinic with extensive experience of managing TED.

STRUCTURED IMPLEMENTATION OF TEAMeD-5

A proposal has been agreed with the Society for Endocrinology's Clinical Committee, the UK Endocrinology Clinical Reference Group, the British Thyroid Foundation (BTF) and the TED Charitable Trust (TEDct), which aims to provide a more formal structure for planning, auditing and implementing the TEAMeD-5 Programme. It draws from experience of successful programmes in other endocrine conditions (e.g. thyroid cancer, neuroendocrine tumours, pituitary apoplexy), where a co-ordinated approach to service provision has led to improved outcomes. The key aspects of the implementation programme are shown in Box 2.

REGIONAL IMPLEMENTATION

It is proposed that the TEAMeD-5 Programme be implemented by NHS Deaneries/Local Education Training Boards (LETBs), as they form a convenient geographical basis for postgraduate training. From April 2018, there are three Deaneries (Scotland, Wales and Northern Ireland) and four LETBS across the UK. Each LETB has subregions corresponding to the previous English Deaneries. See **www.bma.org.uk/advice/career/applying-for-training/find-your-deanery** for regional centres.

Box 2. The TEAMeD-5 implementation programme.

1. Identify a lead endocrinologist in each region to co-ordinate implementation of the programme.
2. Provide specialist training in TED diagnosis and management to all TEAMeD-5 lead endocrinologists and to specialist registrars interested in leading in this area in the future.
3. Ensure that an appropriately configured and expert multidisciplinary service to manage moderate-to-severe TED is present in all regions and receives referrals promptly.
4. Establish, with ophthalmology services, an audit programme including surgical activity and multidisciplinary clinic provision across the UK.

Selection of the regional leads is now well advanced. An initial meeting is planned for later in 2019, with an associated programme of specialist training.

Implementation will be followed by an audit cycle with agreed criteria (see Box 3).

Box 3. TEAMeD-5 draft annual audit criteria.

Audit standard shown in brackets; GD, Graves' disease; FT4, free thyroxine; ^{131}I, radioiodine.

1. No. of patients diagnosed with GD (define criteria used).
2. No. of patients diagnosed with GD with documented screening for TED [80%].
3. No. of patients diagnosed with GD given TEAMeD early warning cards [80%].
4. No. of patients diagnosed with GD given documented smoking advice [80%].
5. No. of patients who contacted person on TEAMeD early warning card.
6. No. of patients referred to TED clinic.
7. Delay from referral to attendance at first TED clinic [3 months].
8. Outcome of patients referred to TED clinic (diagnosis of TED confirmed, treatment given).
9. No. of patients with GD treated with ^{131}I.
10. No. of patients with FT4 below lower limit of normal post ^{131}I [< 25%].

The BTF and TEDct have agreed to jointly support TEAMeD-5 implementation both financially and by means of two part-time staff, Janis Hickey and Lorna Pankethman, who will provide administrative and co-ordinating support.

PETER TAYLOR, ANNA MITCHELL, JANIS HICKEY, JOHN WASS AND COLIN DAYAN ON BEHALF OF TEAMeD
See **www.btf-thyroid.org/TEAMeD-5** for all TEAMeD members

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Enhancing links with industry: EVOLUTION OF THE SOCIETY CORPORATE LIAISON COMMITTEE

In 2018 the Society's Corporate Liaison Board became a full committee of Council. This change is in recognition of the vital role played in our community by our partners in industry and to ensure that the Society's engagement with industry continues to strengthen and develop. Our aim is to work even more closely with industry partners to help identify and develop educational projects and other initiatives that will benefit our members, and the wider endocrine community.

While the Society has always had an essential and fruitful relationship with industry, it has in the past sometimes been rather transactional in nature. Many pharmaceutical companies participate in exhibitions at our conferences and meetings, and several contribute financially to one-off defined initiatives. The Society's Corporate Liaison Board met annually with corporate supporters for feedback on their experience of the Society but it was acknowledged that this left a gap in communication with them for the rest of the year.

IAN RUSSELL
Chief Executive, Society for Endocrinology

"We recognise that industry is a crucial part of our community and we are committed to facilitating dialogue between professionals in industry, academia and clinical practice. In doing so, we can better represent endocrinology as a discipline, identify its challenges and find better healthcare solutions.

Under the guidance of the Corporate Liaison Board, the Society increasingly recognises the importance of forging stronger links with our industry partners, including pharmaceutical companies, biotech companies, equipment manufacturers and service providers, who are also essential for the advancement of research and clinical care. It is important that we have a two-way relationship with these industry partners, and that they are seen by all to be an integral part of the endocrine community as their input can help to advance our discipline.

The new Committee will facilitate our industry links and strengthen communication between these partners and our members. It will also be able to provide oversight and ensure that our relationships with industry are appropriate, beneficial and remain within the strategic aims of the Society.

The Society's relationship with industry goes beyond the clinical care aspects of drug development, delivery and marketing to the changing regulatory environment and how it affects pharmaceutical business, as well as progress in clinical and academic research. By opening up more opportunities for communication and collaboration with industry through the Corporate Liaison Committee, we will build stronger links, and better address challenges in patient care together.

PAUL CARROLL
Chair, Corporate Liaison Committee

"Industry is a vital part of the endocrine community and finding new ways to cultivate functional and responsible relationships is an essential part of the Society's strategy. Over the last couple of years, I have been working closely with the Society's Corporate Relations Team to develop a new working style to help establish the Society's first corporate partnership with Pfizer and beyond.

For example, the Committee is keen to promote communication between the research community and industry, to enable information around the basic science and mechanisms of disease processes to be exchanged with industry expertise on drug discovery. Bringing these parties closer together could open up new opportunities and make important contributions to endocrinology.

The Committee is actively looking for new members, and is especially keen that all areas of endocrinology are represented. The members of the Committee should reflect the diversity of the endocrine community, from basic scientists and researchers to clinicians and nurses, all of whom can bring new insights to our discussions.

DAVID HODSON
Member, Corporate Liaison Committee

"Collaboration between industry and academia is critical if we are to deliver research impact. Such interactions can be quite varied, encompassing big pharma through to new start-ups, but are essential to maximise patient, societal or economic benefit.

Could you help in this area of the Corporate Liaison Committee's work?

If you are interested in joining the Committee, or simply contributing informally to the discussion, please contact Rachel Austin (**rachel.austin@endocrinology.org**) for more information.

Welcome to STARLING HOUSE

THE SOCIETY'S NEW HOME CELEBRATES THE BIRTH OF ENDOCRINOLOGY

In honour of Ernest Starling's pivotal contributions to the field of endocrinology, the Society for Endocrinology's new home has been named Starling House. At our recent opening ceremony, Karen Chapman (the Society's former General Secretary) entertained us with the story of Ernest Starling's remarkable career and life, highlighting why he deserved to have his achievements celebrated in this way.

Ernest Starling was the first person to use the term 'hormone' in public. Together with William Bayliss, he demonstrated the chemical nature of a messenger (secretin) released from intestinal cells that travelled in the blood to 'excite' the pancreas and stimulate the secretion of digestive juices. At this time, almost nothing was known of the nature of hormones or chemical messengers, so this was the birth of endocrinology as a specialist field of medicine. However, it wasn't until 1946, some 40 years after this discovery, that the Society for Endocrinology was founded.

Here, we look back at Starling's incredible journey and life, so vital to the establishment of the field of endocrinology.

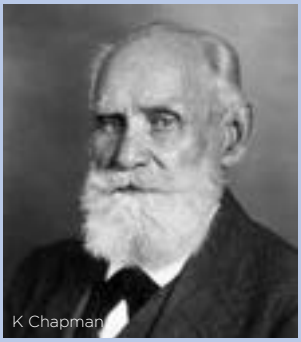
EARLY LIFE

Starling was born and educated in London. He left school at 16 to undertake a scholarship at Guy's Hospital Medical School. During this time, at the suggestion of his mentor, LC Wooldridge, he undertook vacation work with the physiologist Wilhelm Kuhne in Germany. This is where his interest in the digestive system started.

Just after Wooldridge's death, Starling began a very successful collaboration with William Maddock Bayliss at University College, which led to them both being elected to the Physiological Society.

ERNEST STARLING: A TIMELINE

1866 Born in London
1882 Left school at 16
1889 Mentor, LC Wooldridge, dies
1890 Awarded MD from Guy's Hospital Medical School
1890 Married Wooldridge's widow Florence
1890 Elected to the Physiological Society
1891 First paper published with William Maddock Bayliss
1899 Became Jodrell Professor at University College
1899 Demonstrates nervous control of peristaltic wave with Bayliss
1899 Elected Fellow of the Royal Society
1902 Demonstrated chemical-mediated stimulation of pancreas
1905 First used the term 'hormone'
1912 Published textbook *Principles of Human Physiology*
1915 Proposed the basic theory of circulatory control in the heart
1920 Converted the Institute of Physiology to an Institute of Medical Science, integrating physiology with clinical medicine
1924 Demonstrated reabsorption of water in the kidney with Ernest Vernay
1927 Died during journey to Jamaica at 61 years old
1946 Society for Endocrinology founded


K Chapman

Ivan Pavlov announces that Bayliss and Starling are correct,

"Of course they are right. It is clear that we did not take out an exclusive patent for the discovery of truth.

This was a busy period in Starling's personal life, and 2 years after Wooldridge's death, Starling married his widow. This would have been of great financial benefit, since Starling's family didn't have much money and Florence was well provided for by Wooldridge. Bayliss later married Starling's sister, so becoming his brother-in-law.

In 1899, Starling became the Jodrell Professor at University College, and was paid the handsome salary of £264 per annum and elected a Fellow of the Royal Society.

THE BIRTH OF ENDOCRINOLOGY

In 1899, Bayliss and Starling demonstrated the nervous control of the peristaltic wave that moves food through the intestine. However, it wasn't until 1902 that Bayliss and Starling carried out their key experiment showing that the application of acid to the duodenum could stimulate pancreatic secretion. This was the crucial research that showed a chemical messenger, and not a nervous one, had to be responsible.

This was quite a revolutionary concept in 1902, where the accepted doctrine, supported by Pavlov, was that the nervous system mediated communication between organs. Even when their work was published, Pavlov maintained his assertion the nervous system was responsible, until one of his own colleagues repeated the experiment.

Three years later, Starling first used the term 'hormone' during the Croonian Lectures at the Royal College of Physicians in London. He used the Greek verb 'ormao' (to arouse or excite) to derive the name hormone. It seems that the adoption of this term arose from a dinner party conversation with colleagues William Hardy (a biologist) and WT Vesey, a classicist. During the lectures, Starling also outlined his concept of what this new field of endocrinology might become, citing contemporary research on adrenaline and touching on the roles of insulin, gastrin and the sex hormones.

Interestingly, the term 'endocrine' had been suggested to describe islet cell secretions 20 years earlier, but it was only after Starling's


K Chapman

Starling first publicly defines hormones:

"These chemical messengers, however, or hormones (from the Greek ormao, *I excite or arouse) as we might call them, have to be carried from the organ where they are produced to the organ which they affect by means of the blood stream, and the continually recurring physiological needs of the organism must determine their repeated production and circulation throughout the body.*

VITAL STATISTICS

Starling's achievements by today's measures

h-index **29**

4333 citations (average of 65 per item)

926 citations for his 1902 *Journal of Physiology* paper[1]

47 Pubmed results (back to 1913)

63 Web of Science results (1900–1928)

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lectures that it became widely accepted as a general term to describe hormone action.

WORK ACROSS MANY FIELDS

Starling's collaboration with Bayliss lasted approximately 16 years, with the work on secretin being the final phase. Starling's discoveries weren't limited to hormones and the digestive system. He also made ground-breaking discoveries in fluid balance and circulation.

In 1915, he first proposed his 'law of the heart', which remains the basic theory of circulatory control today. With Ernest Vernay, he demonstrated the reabsorption of water by the tubules of the kidney, another substantial discovery with far-reaching implications. One reported interesting idiosyncrasy of Starling's was that, before any experiment, he would religiously present a grain of rice to a replica of the Hindu god Shiva.

Starling made huge contributions to physiology and medical science. His textbook *Principles of Human Physiology* (the companion to *Principles of General Physiology* by Bayliss) was a standard international text for decades. In 1920, with a large bequest from the Rockefeller Foundation, he converted the Institute of Physiology into an Institute of Medical Science, integrating physiology with clinical medicine, a long-held ambition.

In the same year, he contracted malaria during a trip to India and, as he also suffered from heart and bowel problems, he was later advised to rest somewhere warm and sunny. In 1927, he journeyed to Jamaica alone but, when the boat arrived, he was found dead, presumably from heart failure.

Ian Russell and Karen Chapman at the opening ceremony.

Facilities at Starling House.

STARLING'S LEGACY

Starling was a great believer in the ability of scientific research to underpin advances in patient care. This relationship between academic researchers and healthcare professionals is what binds the Society for Endocrinology together, in the pursuit of a better understanding of the discipline and improved patient outcomes.

As we all know, the study of hormones has led to huge benefits for human health and society, such as the control of reproduction, as well as the treatment and prevention of a range of diseases, across all areas of physiology (as reflected by the Society's seven Endocrine Networks).

Very fittingly, the Society's Starling Medal was introduced in 2015 to recognise mid-career endocrinologists whose work has contributed to exceptional scientific advances in endocrinology. Ernest Starling is further recognised by the naming of the home of the Society for Endocrinology as Starling House.

KAREN CHAPMAN
Former General Secretary, Society for Endocrinology

Male hypogonadism and ageing: REJUVENATING THE GUIDANCE

WRITTEN BY RICHARD QUINTON AND JEREMY TOMLINSON

The Society for Endocrinology's position statement on male hypogonadism and ageing has recently been updated. The authors of the 2018 update, Richard Quinton and Jeremy Tomlinson, tell us more.

HOW IS MALE HYPOGONADISM DEFINED?

Male hypogonadism is a clinical syndrome comprising symptoms and signs AND laboratory evidence of testosterone deficiency. Although the diagnosis conventionally requires sexual symptoms,[1–3] testosterone is as important for general health in men as it is for sexual health.

Clinical features can be reproductive (infertility and sexual dysfunction) or non-reproductive (fatigue, reduced physical strength and endurance, loss of motivation or concentration, irritability, low or labile mood, anaemia, and osteoporosis or fracture).

The absence of a ubiquitous male andropause indicates that men with a well-founded diagnosis of hypogonadism should generally receive testosterone therapy. Therefore, contentious issues in older men generally relate to issues of diagnosis rather than treatment decisions.

MORE GUIDANCE, OH WHAT JOY!

Hypogonadism is misdiagnosed, over-diagnosed and undiagnosed in equal measures. There is a worldwide explosion in testosterone prescriptions that by no means target the men with the greatest need or potential to derive clinical benefit.

A plethora of updated diagnostic guidelines have recently appeared that are notable for major differences of emphasis.[4–9] Some of these rather inflexibly champion diagnostic purity,[5,6] but others[4,7,8] are startlingly 'permissive' in terms of diagnostics, treatment and monitoring. By 'permissive' we mean the 'routine diagnosis' of men with borderline-low testosterone and low-normal luteinising hormone (LH) as having secondary hypogonadism (SH) – rather than potentially exhibiting physiological non-gonadal illness (NGI) – and tolerating androgen-induced polycythaemia up to an unphysiological 54% haematocrit.

Accordingly, the Society for Endocrinology's Clinical Committee directed us to update its 2012 position statement, which has broader applicability across all ages and, as we were gratified to discover, has largely stood the test of time. The revised version is now freely available on the Society's website.[10]

WHAT IS LATE-ONSET HYPOGONADISM?

Late-onset hypogonadism (LoH) was originally characterised as a clinical and biochemical syndrome associated with ageing-related co-morbidities (especially obesity), symptoms of testosterone deficiency and consistently low testosterone, after exclusion of classical causes of hypogonadism (e.g. Klinefelter's syndrome, or pituitary tumours).[11]

The number of men with LoH by this original definition is small, with the European Male Ageing Study (EMAS) reporting only 2.1% of men aged greater than 40 years.[1] EMAS also found the decline in serum testosterone to reside overwhelmingly in accumulating NGI (particularly obesity), with only a very limited impact of ageing per se.[1–3] EMAS did, however, identify a small subset of men with genuine age-related primary hypogonadism (PH) and raised LH levels from Leydig cell dysfunction, so the term LoH may be better reserved for older men with otherwise unexplained PH. Although the incidence of PH in men is low (0.2% per year), it increases with both age and illness.[2,3]

SECONDARY HYPOGONADISM OR NON-GONADAL ILLNESS?

Due to physiological suppression of the reproductive axis, older men with common medical conditions (e.g. obesity, metabolic syndrome, type 2 diabetes mellitus, chronic obstructive pulmonary disease, ischaemic heart disease, HIV, inflammatory disease, cardiac, renal and liver impairment) have a higher prevalence of borderline-low serum testosterone levels with low-normal LH.[12] Testosterone levels normalise when these conditions remit (e.g. through lifestyle change) and it is thus not yet established whether these men have genuine SH or NGI instead. The 'Testosterone Trials' identified relatively limited benefits of testosterone treatment on sexual and motor function in older men with SH (or obesity-related NGI?), with 'anaemia' and 'bone density' study arms being the only ones to show major effects.[13,14]

We therefore emphasise the primacy of lifestyle interventions over testosterone treatment in men with borderline-low serum testosterone levels and low-normal LH, unless there are other compelling reasons, such as osteoporosis, anaemia, small testes or sexual dysfunction refractory to first line treatment. Importantly, a diagnosis of hypogonadism, at any age, is more secure when framed in the context of a recognised clinical syndrome (e.g. primary hypogonadism resulting from past orchitis, or SH due to opiate analgesia).

LABORATORY DIAGNOSIS

As LH-stimulated testosterone levels exhibit a circadian rhythm and are acutely lowered by oral carbohydrate intake, the biochemical fingerprint of true SH (low testosterone, with low or inappropriately normal LH level) can be artefactually reproduced by postprandial or afternoon venepuncture. Therefore, serum total testosterone levels should always be measured fasted before 11.00, preferably after a good night's sleep and not during intercurrent illness. Readings below the reference range on at least two different occasions support a diagnosis of hypogonadism, as do raised LH level (signalling PH), low bone density or anaemia.[5,9]

When LH levels are not raised, additional investigations including measurement of prolactin and (when total testosterone is borderline) sex hormone-binding globulin (SHBG) levels, allowing estimation of free testosterone (e.g. **www.issam.ch**), are indicated. Although the validity of free testosterone calculations is not universally accepted,[5] we believe they can usefully improve diagnostic specificity in men with extreme (high or low) SHBG levels, e.g. reassuring obese men with low-normal testosterone and low SHBG levels arising from insulin resistance. They can instead be directed to lifestyle modification.

TREATMENT AND MONITORING

Testosterone treatment of men with a well-founded diagnosis of hypogonadism is effective and safe, and should not be withheld on the basis of age or disability.[15] Modern testosterone preparations achieve more stable, physiological, serum testosterone levels. Treatment aims to achieve serum testosterone levels within the mid-reference range, whilst ensuring a normal haemoglobin and haematocrit. Testosterone treatment should be avoided in men who are actively seeking biological parenthood.

Whilst testosterone treatment in older men with low testosterone and low-normal LH levels that are often underpinned by obesity may confer short term benefits, longer term studies of sufficient power to document clinical outcomes are notably lacking. Therefore, whereas testosterone replacement has been used for many years, effectively and without major adverse effects, in men of all ages with classical hypogonadism, this experience and the risk–benefit balance cannot be extrapolated to older men whose low testosterone levels predominantly reflect frailty or other NGI.[6]

Occult prostate cancer is common in elderly men and, in the absence of

long term studies, it is unclear whether testosterone therapy can promote tumour growth. Therefore, before commencing testosterone treatment in men over 40 years, a history of prostatic symptoms should be taken and prostrate-specific antigen (PSA) should be measured. Surveillance with annual PSA measurement on testosterone treatment is recommended, with referral to urology if abnormal.

However, the overriding concern underpinning treatment is the avoidance of androgen-induced secondary polycythaemia, so haematocrit should be assessed before and annually after therapy, and the replacement dose adjusted accordingly.

The long term effects of testosterone treatment on cardiovascular disease susceptibility are currently unknown[7] and it should therefore be used cautiously in men with symptomatic cardiovascular disease.

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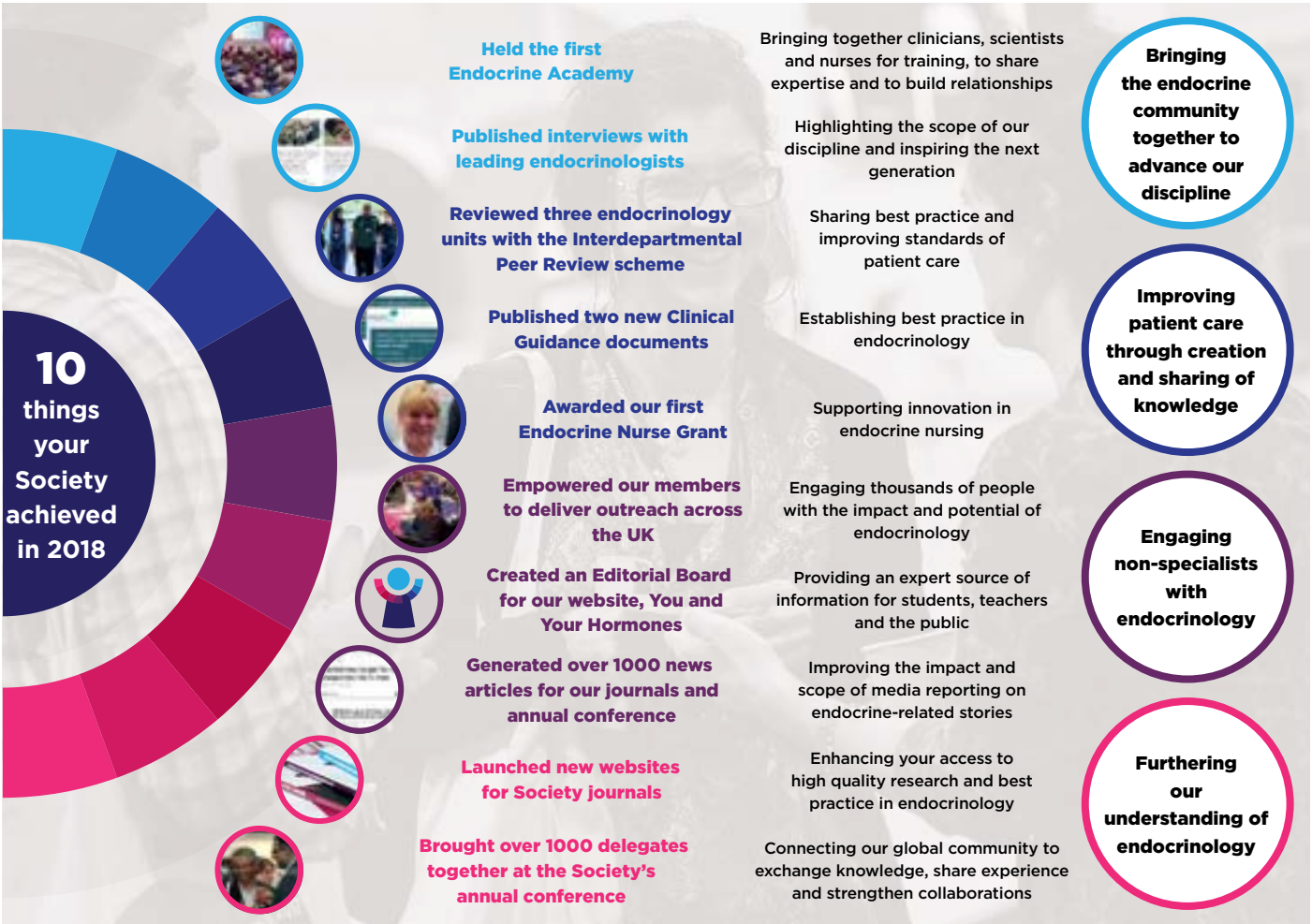

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SAVE THE DATE

Society for Endocrinology BES 2019
Brighton, UK, 11–13 November

www.endocrinology.org/events/sfe-bes-conference/sfe-bes-2019

**Comments taken from SfE BES 2018 post-event survey.*

Celebrating FEMALE PIONEERS IN REPRODUCTION

Lois Salamonsen, Head of the Endometrial Remodelling Laboratory at the Hudson Institute and Adjunct Professor at Monash University, Clayton, Vic., Australia, is a contributor to *Reproduction*'s special issue on female pioneers in the field. *Reproduction* is published by Bioscientifica, the Society's wholly owned commercial subsidiary, which redistributes its profits to the Society. Here, Lois tells us her perspective.

DO YOU HAVE A FEMALE ROLE MODEL IN SCIENCE?

Very early in my career, a wonderful scientist, Glen Metcalf, showed me that it was possible for women to have a meaningful career in science, even with a family. She had so much enthusiasm for science, it was infectious. One of her important findings was the wild variation in progesterone levels as women approach the menopause.

WHAT WERE THE OBSTACLES YOU HAD TO OVERCOME IN RESEARCH?

Obstacles for me were really all about being female. I didn't do medicine because I was female. Only 5% of each class was female and they were given 'a hell of a time' by the all-male team of lecturers. Likewise, after I obtained a first class honours degree in biochemistry, topping the class, I was not invited to do a PhD: that was only for the males. This was before the time of 'women's liberation' so I only started my PhD when I was 40, with two young children and a very supportive husband.

WHAT CHANGES WOULD MAKE SCIENCE MORE ATTRACTIVE TO WOMEN?

Women now have wonderful female role models and are at least equivalent to males in their performance. However, we have not yet overcome 'male dominance'. One thing I have tried to do is to influence the selection of women for important lectures: this is much improved in reproductive sciences, but we still have a way to go. It is also important that our funding bodies, awards committees, etc., acknowledge the full impact of having children on women's opportunities. Not only do they need maternity leave, but, in most instances, the burden of childcare still falls on women.

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Society for Reproduction and Fertility

Oxford Desk Reference: Endocrinology

Helen E Turner, Richard Eastell & Ashley Grossman (Eds)
2018, Oxford University Press, 544 pp,
Hbk, £70, ISBN 978-0-1-9967283-7

Most of us will only buy a single major textbook during our training, which needs to pass the following key tests. Is it affordable? Is it approachable: a 'good read'? Is it comprehensive and up to date? Would I instinctively turn to it, rather than Googling a recent free-to-download review article?

We believe that this book fulfils all these requirements, and so we recommend it to fellow trainees in endocrinology, for whom it will fill a critical gap in their educational needs.

Divided into 21 chapters, it covers the full range of endocrine conditions that we encounter in everyday clinical settings. The mostly traditional format of chapters defined by hormone systems is accompanied by several unique chapters, including hormone resistance syndromes, endocrinology of different age groups, patient advice and reference, speedy reference and a short chapter on medico-legal aspects of endocrinology.

To avoid repetition, some subjects are not covered in the relevant main chapters, e.g. resistance to thyroid hormones is covered in depth in chapter 16 'Hormone resistance syndromes' rather than in chapter 2 'Thyroid hormone metabolism', but when you get used to the layout it's very straightforward. The indexing is very well done, which makes finding subjects very easy.

Each chapter is subdivided into sections, which are concise and to the point. Crucially, the relative references are given after each section, so that each is a coherent piece of information and learning. More than 100 national and international experts contributed expert first-line advice, and their contributions have been seamlessly integrated by the editors.

Apart from very few figures that needed to be in colour, the book is monochrome throughout, but we all live in a technicolour world and we hope that future editions will be able to offset the costs of colour figures against economies of scale arising from a bigger print run.

An area meriting specific commendation is section 1.4 'Hormone measurements', which provides an excellent explanation of hormone action and the different types of immunoassay (of great value particularly for lab-naïve clinicians). Having said that, some relevant information (e.g. causes of interference, false-positives and false-negatives) was not covered here, instead appearing in chapter 18 'Endocrine investigations, nursing and dietetics'.

Chapter 19 'Patient advice and reference' has some diagrams that clinicians might find extremely helpful when explaining conditions to patients. The 'Speedy reference' (chapter 20) is a great innovation, although many more conditions could usefully have been added to the benefit of endocrine trainees and nurses and, perhaps, even generalist physicians.

This is an easy-to-read, authoritative and practical handbook, which will be very useful for clinical practice and exam revision (e.g. SCE or MRCP part 1 and 2). It is also excellent value for money. As it's the kind of book that, once loaned out, will somehow never get returned to consultant or departmental bookshelves, we simply recommend investing in a personal copy.

AZMI MOHAMMED AND ELTAYEB ABDELAZIZ
South Tees Hospital NHS Foundation Trust

ENSURING SUFFICIENCY IN ADDISON'S DISEASE

WRITTEN BY MICHELLE NATION AND BECCI WATLING

Treatment of Addison's disease/adrenal insufficiency requires timely oral steroid replacement therapy, and dose adjustment in response to day-to-day well-being and acute illness. Most patients are independently self-caring and will have an emergency strategy in place for treatment to prevent crisis, such as teaching basic dosing knowledge and injection instructions to a friend, work colleague or loved one.

In acute illness and when receiving emergency care from healthcare professionals, any lack of understanding about the disease and about sick day rules may result in delays in treatment and increased anxieties, both for the patient and for relatives, as well as being potentially life-threatening.

IDENTIFYING THE PROBLEM

Emergency admission to hospital involves placing trust in the healthcare professionals to dispense and prescribe the right therapy at the right time. However, people who live with long term conditions, such as Addison's, often find that they know more about managing their symptoms and condition than those who are tasked with the responsibility.

Through discussion with our patients with adrenal insufficiency or Addison's disease, we have repeatedly heard of instances of admission to hospital only to find healthcare professionals who have very little awareness of adrenal insufficiency and the need for increased steroid requirement.

'It was established there was a generalised lack of understanding by healthcare professionals of the importance of steroid replacement dosing and timing in Addison's disease or adrenal insufficiency.'

Medication rounds in many clinical environments are structured and hospital patients are given their medication by a third party at the discretion of the ward's workload. This may not be necessarily at the time the medication is needed, demonstrating a potential lack of knowledge and specialist input on the part of the healthcare professional.

At the Royal Bournemouth and Christchurch Hospitals NHS Trust, we have a Learning Event Report Notification (LERN) reporting system, which is a governance tool for service improvement and risk assessment.

We identified two incidences where patients did not receive the correct treatment (i.e. steroid replacement at the right time) and/or did not have the doses increased in accordance with their presenting illness. It was established that there was a generalised lack of understanding by healthcare professionals of the importance of steroid replacement dosing and timing in Addison's disease or adrenal insufficiency.

FINDING A SOLUTION

To address this issue for patients with adrenal insufficiency, we have now introduced a whole-time equivalent endocrine specialist nurse outreach support service, to give patients and allied health professionals specialist education, support and advice during hospitalisation.

Furthermore, not receiving the correct dose or formulation of steroid replacement when it is due is under review by the Society for Endocrinology with a view to classification as a 'never event'.

We have, through the Trust's information technology department, set up steroid coding flags to identify patients electronically when they are admitted, and an automated email is sent to the dedicated endocrine specialist nurses (with information about date of admission and location).

The specialist nurses then visit the patient, to address any therapy issues and patient concerns. When the patients are visited on the wards, we also take the opportunity to update them on sick day rules and injection training, which is beneficial.

THE SYSTEM IN PRACTICE

Since February 2018, we have had 20 e-mail alerts. As a result, we have been able to visit patients sooner after admission and address any concerns or lack of knowledge before any harm has occurred from missed, delayed or insufficient dosing. It has also promoted the re-engagement of patients and the promotion of future clinic attendance.

The ward visits also lend themselves to immediate ward-based education and updates for acute staff, and we are able to document admission and discharge therapy plans in notes and hand out information to both carers and patients. Managing therapy at appropriate doses and in a timely fashion allows a speedier recovery for patients, and we will be looking into the advantages this may bring in length of stay reduction as a future audit.

'The endocrine outreach service has reduced patient anxiety and therapy errors at ward level, whilst offering education to staff previously unaware of the management of endocrine emergencies.'

The endocrine outreach service has reduced patient anxiety and therapy errors at ward level, whilst offering education to staff previously unaware of the management of endocrine emergencies.

We plan to continue to make best use of this momentum by gathering more evidence regarding other endocrine disorders (e.g. diabetes insipidus) within the Trust, and also to consider an evidence-based quality of life tool/questionnaire to provide more robust qualitative data in order to support an audit for clinical governance.

MICHELLE NATION AND BECCI WATLING
Endocrine Nurse Specialists, Bournemouth Diabetes and Endocrine Centre, Royal Bournemouth Hospital

'FINE' PROGRESS: THE FEDERATION OF INTERNATIONAL NURSES IN ENDOCRINOLOGY

The collaborative work of the Federation of International Nurses in Endocrinology (FINE) has been ongoing since our inaugural meeting in Chicago, IL, USA, in 2014, and was boosted by our first international nursing programme at the International Congress of Endocrinology (ICE) in Beijing, China in 2016.

Our aims include: sharing evidence-based practice, bench-marking nursing practice and raising the standard of endocrine nurse education globally. Membership and interest have grown, and we now have representation from 23 countries, with a newly formed and appointed board of directors.

ICE 2018 in Cape Town, South Africa, incorporated a successful joint programme from FINE and the Diabetes Education Society of South Africa (DESSA). Our nurses' programme ran over 2 days, with delegates attending from 11 countries. Several nurses were also invited to present as part of the main symposium.

Delegates at ICE 2018. ©L Shepherd, A Marland, K Davies

The excellent programme began with a keynote presentation by Hester Klopper (Stellenbosch, South Africa) on 'Strategic initiatives and internationalisation'. Other sessions realised the differences in global healthcare systems and the importance of the nurses' role in providing the best care and education within allocated resources. Endocrine nurses from the UK had a strong presence on the programme. Outside the conference, our friendship continues to develop, with a visit to Table Mountain being a highlight of the social events.

We look forward to continued development of this inclusive, dynamic group, who ultimately have one vision: to improve patient care through endocrine nursing.

Further information is available at **www.FINEnurses.org**. Please share any programme suggestions you have for ICE 2020, in Buenos Aires, Argentina on 9–13 October 2020.

LISA SHEPHERD, ANNE MARLAND AND KATE DAVIES

ANNE MARLAND

NURSE COMMITTEE CHAIR

I'm delighted to be taking over as Nurse Committee Chair from Lisa, and I thank her for her leadership and innovation. I will endeavour to support and pursue the vision of nurses working within endocrinology in the UK.

Our roles are diverse, and we should all be very proud of what we achieve in our day-to-day working lives. Many of our international nurse colleagues now benchmark their clinical practice against innovation from the UK. You can read some of the exciting developments created through international collaboration in the FINE article on this page.

This is an exciting time for nurses, as we develop and extend our roles, through continuing professional development, research and wonderful innovation. I hope to see many of you at Endocrine Nurse Update on 8–9 April in Birmingham. This is a fantastic opportunity to network and increase your clinical knowledge. Remember to fill out the feedback forms, as this is how we can develop our training to suit all your needs.

I also encourage you to submit an abstract for the SfE BES conference in Brighton this November. As nurses, we should be proud of our achievements and our enquiring minds, so go on, give it a go!

I thank Michelle for her article about an innovative approach in adrenal insufficiency. Primary and secondary adrenal insufficiency can lead to an adrenal crisis, and still has an unfortunate mortality rate. Michelle's article reflects how a dynamic nursing strategy within the synergistic multidisciplinary team can positively influence outcome and deliver optimum patient care. Michelle also highlights areas for future research – which reminds me to encourage you to apply for the Endocrine Nurse Grant (see **www.endocrinology.org/grants-and-awards/grants/endocrine-nurse-grant** for details). The next application deadline is 15 May.

I welcome ideas from you all. Please encourage your colleagues to become Nurse Members of the Society, as we are a vibrant community with a voice. Membership is a way to become more actively involved in issues which affect our profession.

BEST WISHES

ANNE MARLAND

VIVIAN HT JAMES

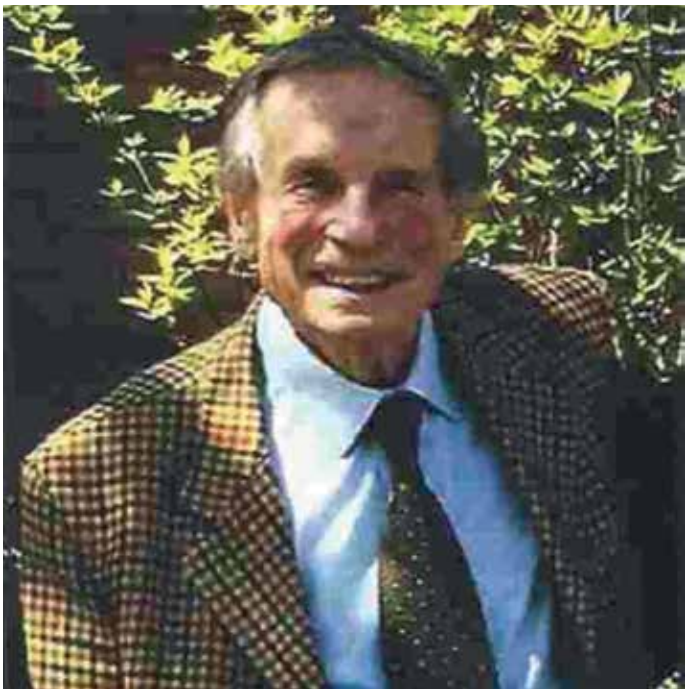
Vivian James was an eminent endocrinologist who contributed much to our field.

Professor James was one of the longest-standing members of the Society for Endocrinology, joining in 1961 and maintaining his membership for 57 years. He was appointed the Head of Chemical Pathology at St Mary's Hospital in London in 1973 and he held that position until his retirement. His qualifications included a BSc, ARIC, PhD, FRSC, MRCPath, DSc and FRCPath, and he was particularly recognised for his expertise on steroid hormones.

Vivian started his working life as a technical assistant in a metallurgical laboratory, a vocation that did not meet with his expectations. With the outbreak of World War II, Vivian decided to 'do his bit' and was accepted into the RAF, even though he was under 18. Following a short course in aeronautical engineering at the University of Cambridge, and then pilot training, Vivian spent his active service flying Avro Lancaster planes as transporters in the Middle East.

In 1947, Vivian was demobbed, and he then read chemistry at University College London, graduating with special honours in 1950. After a couple of years in the pharmaceutical industry, Vivian was appointed to the scientific staff of the Medical Research Council (MRC), where he carried out research on the synthesis of steroid hormones. During that period he completed the work for a PhD. Vivian then competed for a fellowship awarded by the Centre Nationale de la Recherche Scientifique, enabling him to study endocrine biochemistry at the École de Médecine in Paris, France.

In 1956, Vivian was appointed to a lectureship in chemical pathology at St Mary's Hospital Medical School, the place where he spent the rest of his career. He rose to the challenge, setting up a highly successful steroid research unit that was almost entirely supported by outside funding, including the MRC, the CRC and various pharmaceutical firms. Under his wing, the department also provided a supra-regional assay service for steroid hormones, of which Vivian was Director when it was initiated in 1968. In 1967, Vivian was awarded a Chair in chemical endocrinology and this was followed in 1973 by a Chair in chemical pathology and also the headship of the department, a remarkable achievement, no doubt helped by Vivian earning the trust and support of senior staff qualified in medicine.



Vivian's intellect, knowledge and impeccable professional courtesy resulted in him undertaking key roles on various committees, too many to all be named here, but including those connected with aspects of the NHS, as well as the Biochemical Society and the Society for Endocrinology. Vivian also took on the position of President of the Endocrine Section of the Royal Society of Medicine.

Additionally, he participated on various editorial boards and he was the founding Editor of the highly successful journal *Endocrine-Related Cancer*. Further roles within the Society for Endocrinology included Treasurer and General Secretary. He was instrumental in the establishment of Bioscientifica Ltd and in shaping the Society's investment portfolio, ensuring that the Society received external professional financial advice. Vivian also chaired a working group which subsequently founded the European Federation of Endocrine Societies (the forerunner of the European Society of Endocrinology), where he was the first Federation Secretary General.

There were obviously many achievements in Vivian's career, but he considered one highlight to be at an endocrine conference in Italy. He had decided, rather bravely, to present his paper in Italian, a language he had only learnt later in his working life. His presentation was part of a parallel session and few delegates had turned up to listen, he presumed because his talk was expected to be in English. Fortuitously, the conference organisers had arranged for presentations from that lecture theatre to be broadcast in other areas of the conference centre. As his presentation progressed, more and more Italian delegates turned up to listen to this Englishman presenting science in their native language. When he finished his presentation, the lecture theatre was packed and the applause was resounding!

Vivian also trained several endocrinologists from abroad and, for this, he was awarded the Fiorini d'Oro (Golden Florin) by the City of Florence, an honour which is normally reserved exclusively for Italians. He was also elected an honorary member of the Italian Endocrine Society.

With retirement, Vivian held an emeritus position at St Mary's, the Medical School by then having become part of Imperial College London. His expertise in steroid biochemistry and analysis continued to serve him well as, in retirement, he chose to act as an expert witness in cases connected with doping in sport, both nationally and internationally. He attracted the attention of UK Sport, which asked him to form and chair a scientific committee inquiring into the contentious problem concerning the anabolic steroid nandrolone, with a key review being issued in January 2000 and a progress report in February 2003. His last three research publications were in 2009, concerning aspects of the oral contraceptive norethisterone in relation to the nandrolone sport test.

Vivian James touched numerous lives, and many of those who knew him greatly respected him, not only as a scientist, but also as a sincere, kind and helpful man.

ANDREW KICMAN
King's College London

PAUL KELLY

Paul Kelly was an endocrinologist of international renown.

After his PhD in endocrinology and reproductive physiology from the University of Wisconsin (WI, USA), in 1972, Paul went to Canada to undertake his postdoctoral training in the laboratories of the well-known Professors Henry Friesen (McGill University, Montréal, and University of Manitoba, Winnipeg) and Fernand Labrie (Laval University, Québec City).

In 1975, at Laval University, Paul joined the Molecular Endocrinology Group of the Medical Research Council of Canada and, in 1983, he became a full professor in the Department of Medicine of McGill University, where he created the Laboratory of Molecular Endocrinology that he directed until 1991.

He then decided to move to France, specifically to the Faculty of Medicine Necker at the University of Paris Descartes, where he created Inserm Unit 344. He led the unit for 15 years as a Senior Director of Research, followed by an appointment as a university hospital professor.

During this time, Paul played a key role in a project to bring together several laboratories on the Necker campus and, in 2007, he succeeded in creating the Research Center for Growth and Signalling (Inserm Unit 845), which he directed until 2010. This has become a department of the present Institute Necker Enfants Malades (Inserm Unit 1151), of which Paul was a member until 2014 as an Emeritus Professor.

Besides science and research, Paul also contributed significantly to the evolution of the Necker campus at the turn of the 20th century. He was Director of the Institut Fédératif de Recherches between 2000 and 2010.

Paul was a visionary; his actions stimulated the emergence of several core technological facilities. Despite numerous obstacles, Paul persevered in his aim, and today the entire Necker research community is indebted to him.

During his career, Paul made fundamental contributions to the field of research on the hormone prolactin. After making significant advances in the actions of prolactin at Laval University, Paul and his team at McGill University made an internationally acclaimed breakthrough by cloning the prolactin receptor (*Cell* 1988 **53** 69–77). This result constituted the basis of the work that he continued at the Faculty of Medicine Necker, to elucidate the molecular mechanisms of action of prolactin and, using a prolactin receptor-deficient mouse model, the complex pathophysiology of this pleiotropic hormone.

Paul was strongly involved in editorial activities, and served as Editor of numerous leading journals in the field of endocrinology. Together with E-E Baulieu, Paul edited the famous textbook *Hormones: From Molecules to Disease* (1990). He was Chairman for Basic Research at the 82nd Annual Meeting of the Endocrine Society in 2000 and chaired the Gordon Research Conference on Prolactin in 2002.

Paul was a member of nine distinguished societies. He published over 400 peer-reviewed articles and was a recipient of several prestigious honours and awards, including the Chair in Molecular Endocrinology of the Fondation de France, the Gerald D Aurbach Award and the French Ordre National du Mérite.

During his exceptional scientific career, Paul remained humble. Accessible and always turned towards others, he was instrumental in the early careers

of a great number of young scientists who, today, are infinitely grateful. He was also an exceptional teacher.

Henry Friesen says, 'I recall an earlier period both at McGill and the University of Manitoba when the terra incognito of the domains of prolactin and growth hormone receptors were beginning to be explored. And of course Paul Kelly, Bob Shiu, and Michael Waters were pioneers and trailblazers in the journey of discovery in my lab at that time. But it was Paul Kelly, with his team, who pursued the scientific quest using ever more sophisticated tools to define the mysteries and mechanisms of the prolactin receptor–ligand hormone interactions and the post receptor signals. It was a monumental achievement, made even more heroic as the advances and progress occurred despite the intrusive health challenges he faced over an extended period. Endocrinology has lost a leader and a creative contributor whose life is a shining example of the triumph of the resilience of the human spirit in the face of crippling adversity.'

We will remember Paul Kelly as a leading scientist in his field, a mentor, a federator and, perhaps above all, a man of incomparable kindness and rare humanism.

VINCENT GOFFIN, HANS ZINGG, CHARLOTTE SUMIDA, PHILIPPE TOURAINE AND HENRY FRIESEN

Images by ENDOCRINOLOGISTS

- *Are you a keen photographer?*
- *Do you take photos with your smartphone?*

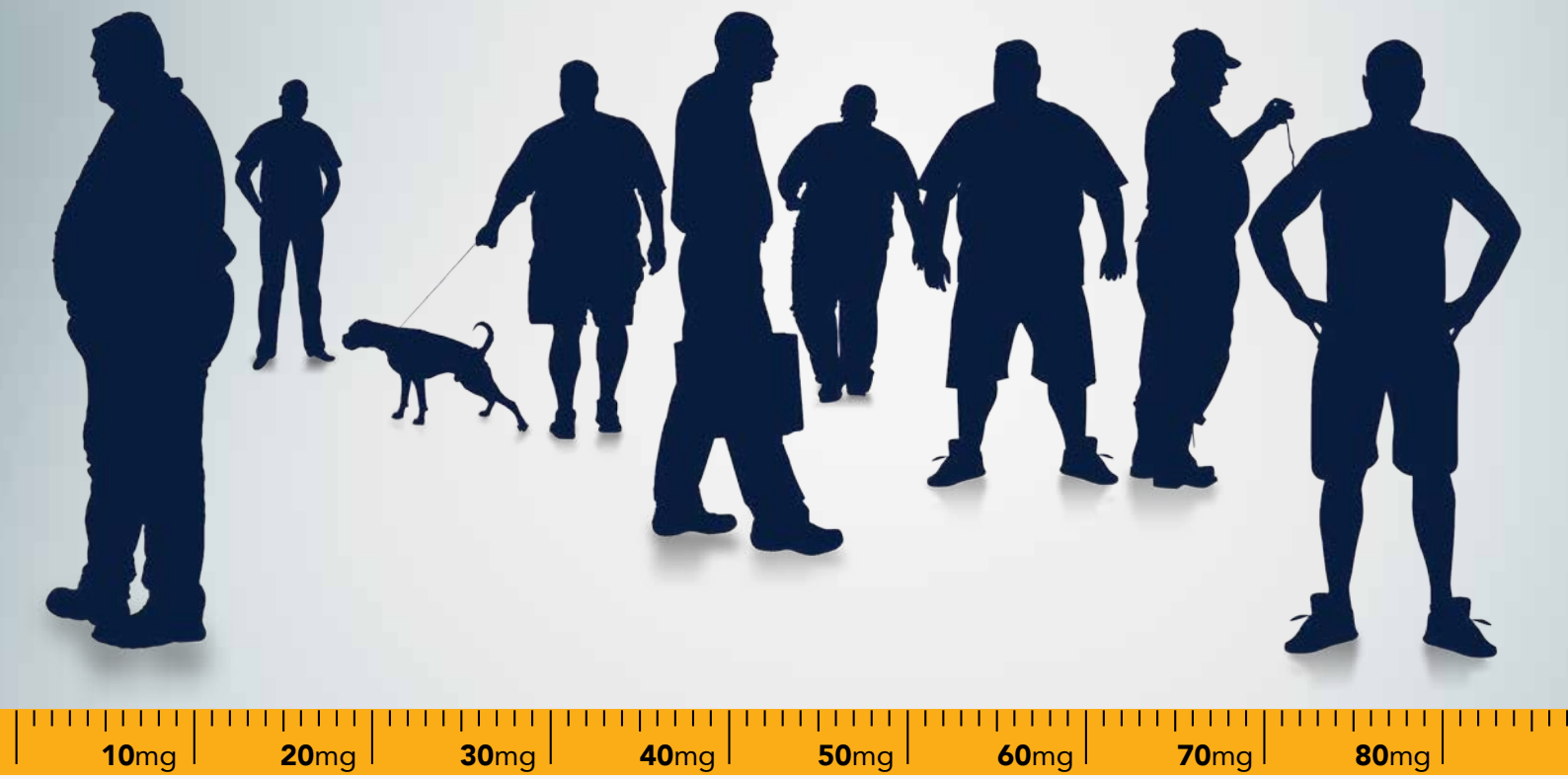
If so, our new feature 'Images by endocrinologists' is yet another reason to read *The Endocrinologist*.

Send us your best photos (high resolution please), along with either a reason why you like the shot or, if you prefer, simply a title for your photo and your name and institution. Your image should be emailed to: **endocrinologist@endocrinology.org**. The Editorial Board will choose one or more images to publish inside the back cover of each issue of *The Endocrinologist*.

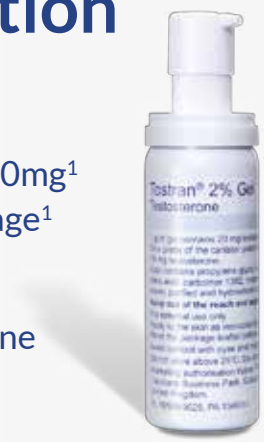
This issue's photo was taken by Alexander Comninos (Imperial College London), and has the caption 'Waljit asking for a lift back to the International Congress of Endocrinology in Cape Town'.

For male hypogonadism with confirmed testosterone deficiency[1]

EVERYBODY is different...



...but with Tostran's flexible titration you can tailor the dose



- Tostran offers titration in 10mg increments - from 10mg up to 80mg[1] - allowing individualised dosing for patients, with minimal wastage[1]

  - the usual dose range is 40-80mg per day[1]

- Tostran offers a cost-comparable NHS price to other testosterone gel products, with the price per mg of testosterone at £0.02[2]

Tostran® (testosterone) 2% Gel Prescribing Information
Please refer to the full Summary of Product Characteristics before prescribing.
Presentation: Tostran 2% Gel, contains testosterone, 20 mg/g. **Indication:** Testosterone replacement therapy for male hypogonadism when testosterone deficiency has been confirmed by clinical features and biochemical tests. **Dose:** The starting dose is 3 g gel (60 mg testosterone) applied once daily to clean, dry, intact skin, on the abdomen or to both inner thighs. Adjust dose according to clinical and laboratory responses. Do not exceed 4 g of gel (80 mg testosterone) daily. Apply after washing, bathing or showering. Do not apply to the genitals. Do not use in women, or children under the age of 18 years. **Contraindications:** Known or suspected carcinoma of the breast or the prostate; hypersensitivity to any of the ingredients. **Special warnings and precautions for use:** Not to be used to treat non-specific symptoms suggestive of hypogonadism if testosterone deficiency has not been demonstrated and if other aetiologies have not been excluded. Not indicated for treatment of male sterility or impotence. Monitor testosterone at regular intervals. Adjust dose to maintain eugonadal testosterone level. Experience in patients over 65 years is limited; account for lower serum testosterone with increasing age. Pre-examine all patients to exclude a risk of pre-existing prostatic cancer. Perform regular monitoring of breast and prostate. Androgens may accelerate the development of subclinical prostatic cancer and benign prostatic hyperplasia. Use with caution in thrombophilia due to risk of thrombosis. Monitor haemoglobin, and haematocrit, liver function tests and lipid profile during long-term use. Oedema with/without congestive heart failure may be a severe complication in patients with pre-existing severe cardiac, renal, or hepatic insufficiency, or ischaemic heart disease. Discontinue immediately if such complications occur. Use with caution in hypertension, epilepsy, migraine and sleep apnoea as these conditions may be aggravated. Care should be taken with skeletal metastases due to risk of hypercalcaemia/hypercalciuria. Androgen treatment may result in improved insulin sensitivity. Inform the patient about the risk of testosterone transfer and give safety instructions. Health professionals/carers should use disposable gloves resistant to alcohols. **Side-effects:** *Very common:* Application site reactions (including paresthesia, xerosis, pruritis, rash or erythema). *Common:* Increased haemoglobin, red blood cell count, and haematocrit. Increased male pattern hair distribution. Hypertension, gynaecomastia, peripheral oedema, and increased PSA. May cause irritation and dry skin. Prescribers should consult the summary of product characteristics for further details of side effects. **Legal Category:** POM. **Further Information is available from the Marketing Authorisation Holder:** Kyowa Kirin Ltd, Galabank Business Park, Galashiels, TD1 1QH, UK. **Date of Prescribing Information:** March 2017.

For the United Kingdom: Pack Size and Price: Pack contains one 60 g metered-dose canister. Price £28.67. **Marketing Authorisation Number:** PL16508/0025.

Adverse Events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard.
Adverse events should also be reported to Kyowa Kirin Ltd on +44 (0)1896 664000, email medinfo@kyowakirin.com

References: 1. Tostran 2% Gel SPC. **2.** eMIMS October 2018.

UK/M015/0560. Date of preparation: January 2019

KYOWA KIRIN

TOSTRAN®
2% TESTOSTERONE GEL